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TECHNICAL INSPECTION REPORT.

CONFIDENTIAL

Classification (Cancelled) (Changed to _____)
By authority of Joint Chiefs of Staff (Action 15 Apr 49)
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367452

(6) OPERATION CROSSROADS.

U.S.S. NEW YORK (BB34).

(8) TEST BAKER (U).

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Director
Defense Atomic Support Agency
Washington, D. C. 20301

of the

ARMED FORCES
SPECIAL WEAPONS PROJECT

(11) 1947,
(12) 175p.

OPERATION CROSSROADS

DIRECTOR OF SHIP MATERIAL

JOINT TASK FORCE ONE

CONFIDENTIAL

[redacted]

REG. NO. 116IA E

8041

[redacted] 1948

BUREAU OF SHIPS GROUP

TECHNICAL INSPECTION REPORT

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APPROVED:
F.X. Forest,
Captain, U.S.N.

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[redacted]

USS NEW YORK (BB34)

Page 1 of 175 Pages

GROUP-3
Downgraded at 12 year intervals;
Not automatically declassified.
1 JAN 1965

[redacted]

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U.S.S. NEW YORK (BB 34)

SHIP CHARACTERISTICS

Building Yard: New York Naval Shipyard.

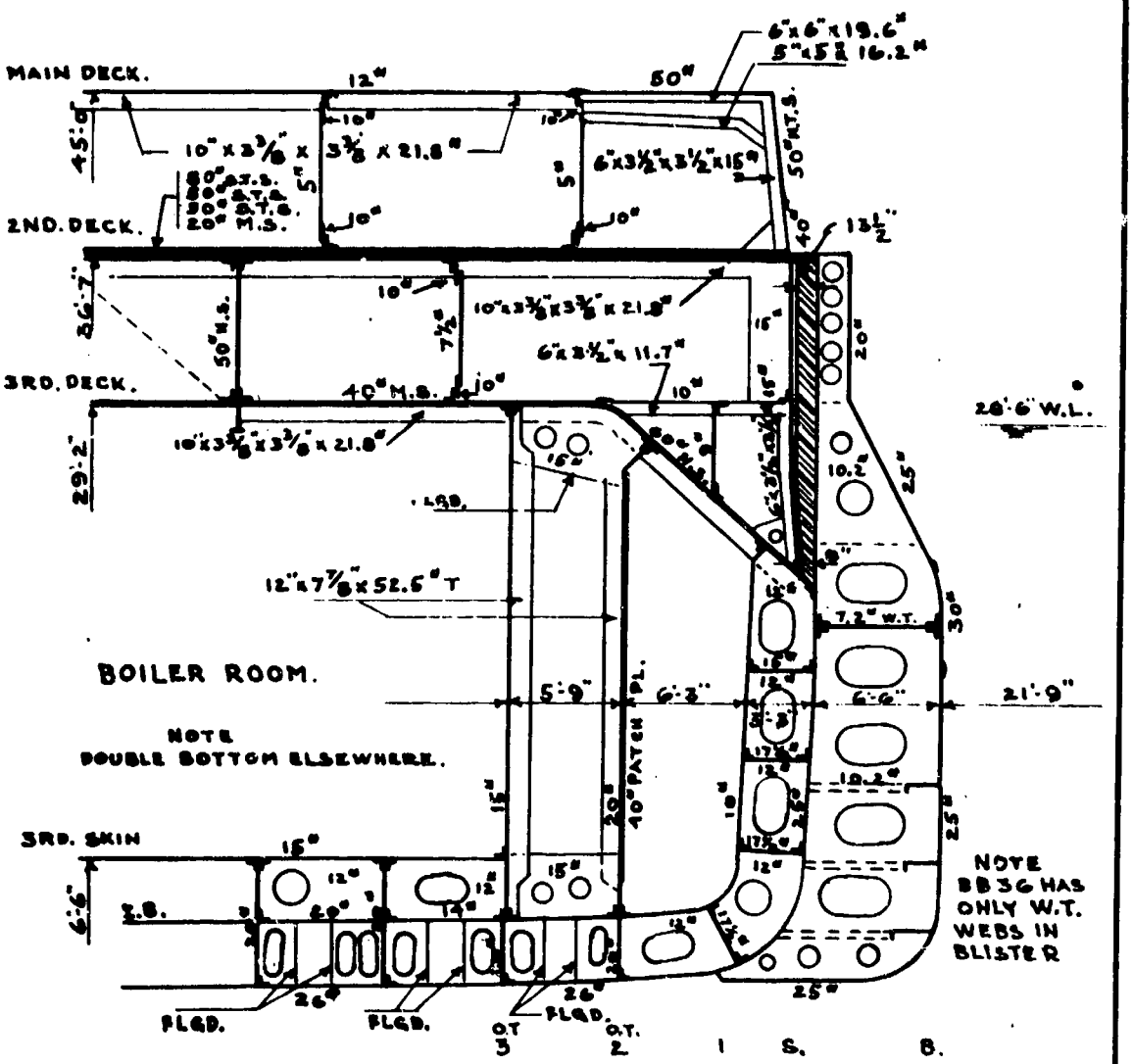
Commissioned: 15 April 1914.

HULL

Length Overall: 572 feet 8 inches.
Length on Waterline: 565 feet 0 inches.
Beam (extreme): 106 feet 1 inch.
Depth (molded at side, to main deck, amidships): 48 feet 8 3/4 inches.
Drafts at time of test: Fwd. 27 feet 10 inches.
Aft. 30 feet 2 inches.
Standard displacement: 27,000 tons.
Displacement at time of test: 30,550 tons.

MAIN PROPULSION PLANT

Main Engines: Two-four cylinder, triple expansion direct acting-reciprocating.
Boilers: Six installed - 295 psi gauge, Dyson express type. Mfgd. by New York Eng'g. Co.
Main Condensers: Two installed, 13104 sq. ft. cooling surface. Mfg'd. by Navy Yard, N.Y.
Turbo Generators: Four installed, 400 KW. Mfg'd. by Westinghouse Electric Co., turbines by the Moore Steam Turbine Co., Division of Worthington Pump Co.
Main Shafts: Two installed, outside dia. 18", inside dia. 11 1/2".
Propellers: Two installed, Mfg'd. by N.Y. Phil.



MIDSHIP SECTION

TEST B

SECRET

U.S.S. NEW YORK (BB 34)

8041

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

(a) Drafts after test; list; general areas of flooding, sources.

HULL

	Forward	Aft	List
Drafts before test	28' 3"	30' 1"	0°
Drafts after test	25 6"	33' 6"	1 1/2° port.

Flooding is confined to the after portion of the vessel. It originated in open seams in the after trimming tanks, and progressed through small leaks in bulkheads which are in poor condition due to the age of the ship. Flooding occurred in handling rooms and machinery spaces as the result of a poorly designed gravity drain system which connects spaces in the stern with compartments within the armor citadel.

The following spaces containing machinery were flooded: Starboard shaft alley, electric steering gear room; after diesel room. It is believed that all of this flooding could have been controlled if the crew had been aboard.

(b) Structural damage.

HULL

There is no structural damage in the superstructure. Damage below decks in interior compartments is negligible. Some barbette supports are stressed. The hull has several opened seams in the after trimming tanks, D-12 and D-13.

MACHINERY

No comment.

ELECTRICAL

Not observed.

(c) Other damage.

HULL

Flooding has caused some immersion damage aft. Main machinery is operable. Directors, turrets and radar suffered shock damage.

MACHINERY

The casings of boilers 3 and 4 received minor damage, and are parted at joints. The electric steering system, after emergency diesel generator, and after diesel fire pump were damaged by flooding. The after auxiliary condenser and both distilling units show evidence of considerable momentary displacement. They may have internal leaks, but no damage is apparent from visual inspection. There is a considerable amount of minor damage throughout the machinery spaces, such as minor leaks in piping, gages disarranged, water column gages (glass) broken, etc.

ELECTRICAL

Emergency generator and steering motors were disabled by flooding.

Both master gyro compasses were damaged by failure of sensitive element suspension springs and spilling of mercury.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

There is no evidence of heat.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat.

(b) Fires and explosions.

HULL

There were no fires or explosions.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of fire or explosions.

(c) Shock.

HULL

Underwater shock was sufficient to lift 14-inch shells out of stowage, fracture cast-iron foundations, damage holding-down clips and turret machinery and upset directors.

MACHINERY

The NEW YORK received an underwater shock of high magnitude. Shock and the resultant whipping motion of the ship caused most of the damage to the machinery installation. Leads left in two of the main bearings of the port main engine indicate momentary displacement of crankshaft of the order of .016 inch, which is additional evidence of heavy shock.

ELECTRICAL

The damage to both master gyro compasses and the broken casting on the dynamo room vent set indicates the presence of shock.

(d) Pressure.

HULL

There is no evidence of pressure. Bulkheads topside which were damaged in test A have somewhat increased damage, probably as the result of wave action.

MACHINERY

No evidence.

ELECTRICAL

No evidence of pressure was observed.

(e) Any effects apparently peculiar to the atom bomb.

HULL

Radioactivity is the only peculiar effect.

MACHINERY

An underwater shock of such high magnitude at this distance from an explosion plus the violent displacement of the ship, is apparently peculiar to the atom bomb.

ELECTRICAL

The only effect peculiar to the atom bomb was the persistent high radioactivity of the exposed areas.

III. Effects of Damage.

(a) Effect on machinery, electrical and ship control.

HULL

Holding-down bolts on the steering pedestal in the steering gear room are sheared. Main machinery and generators are operable.

MACHINERY

Damage to boilers 3 and 4 made them inoperable, but repairs could have been made by the ship's force within 4 hours. The after auxiliary condenser and the main distilling plant may have been made temporarily inoperable by tube leaks. Some non-vital machinery is inoperable because of flooding, which could probably have been controlled if the crew had been aboard. As the steam steering engine is operable, flooding of the electric steering system would not have impaired operation of the ship.

ELECTRICAL

Electrical failures would have had no effect on propulsion or ship control.

(b) Effect on gunnery and fire control.

HULL

Shock damage has resulted in the inoperability of three 14-inch guns, but all turrets are operable despite damage to holding-down clips. The main battery control director scope foundation is fractured and two directorscopes in the secondary battery control station are badly damaged.

MACHINERY

No comment.

ELECTRICAL

The failure of both master gyro compasses would have seriously affected fire control.

(c) Effect on watertight integrity and stability.

HULL

There are several seam leaks in the hull plating aft. Extensive flooding occurred through bulkheads and piping systems. The watertight integrity of the bulkheads is poor because of the age of the vessel and not as a result of the test. The vessel took a list of 1 1/2 degrees to port but stability was not seriously reduced.

MACHINERY

No comment.

ELECTRICAL

Watertight integrity and stability was not impaired by any electrical failures.

(d) Effect on personnel and habitability.

HULL

Shock would have caused numerous casualties. All compartments except those flooded are habitable.

MACHINERY

It is estimated that there would have been few, if any, casualties to personnel below decks. Habitability was not affected except for radioactivity.

ELECTRICAL

Electrical failures had no effect on personnel habitability of the vessel.

(e) Total effect on fighting efficiency.

HULL

Fighting efficiency is considerably impaired by shock damage to turrets and fire control and by flooding in the after spaces.

MACHINERY

Maximum speed would have been reduced to about 18 knots for a few hours while boilers 3 and 4 were being repaired. It is not believed that the test would have had any other effect on fighting efficiency as far as machinery is concerned.

ELECTRICAL

Damage to both master gyro compasses would have seriously affected fire control.

IV. General Summary of Observer's Impressions and Conclusions.

HULL

Shock damage seriously curtailed the fire power of this ship. Poor integrity of watertight bulkhead and leakage through drainage systems was largely responsible for progressive flooding. Strength and propulsion are relatively unimpaired.

MACHINERY

It is not believed that the boilers of a modern battleship would have been damaged by a shock such as the NEW YORK received. However, a main turbine in operation receiving a shock sufficient to cause movement of the rotor cf like magnitude (.018 inch maximum) would probably be damaged. The NEW YORK has reciprocating engines.

ELECTRICAL

The Arma Mk VIII Mod. 3A gyro compass stands out as a critical weakness in the electrical equipment of modern ships.

V. Any Preliminary General or Specific Recommendations.

HULL

The type of turret holding-down clip installed on this vessel merits study. The conditions which permitted progressive flooding are fundamentally due to the age of the vessel and antiquated design. No recommendations, are made as modern vessels have already received corrective action.

MACHINERY

As the machinery of the NEW YORK is of obsolete design no specific recommendations based on her experience would be pertinent. However, the general recommendation is submitted that every effort be made to improve the resistance of naval machinery to shock.

ELECTRICAL

Gyro compasses requires modification and improvement to make them equal in damage resistance to other electrical equipment.

TECHNICAL INSPECTION REPORT

SECTION I - HULL

GENERAL SUMMARY OF HULL DAMAGE

I. Target Condition After Test.

(a) Drafts, List, General areas of flooding, sources.

	Forward	Aft	List
Drafts before test	28' - 0"	30' - 1"	0°
Drafts after test	25' - 6"	33' - 6"	1 1/2° Port

Flooding is confined to the after portion of the vessel. It originated in open seams in the after trimming tanks, and progressed through small leaks in bulkheads which are in poor condition due to the age of the ship. Flooding occurred in handling rooms and machinery spaces as the result of a poorly designed gravity drain system which connects spaces in the steam with compartments within the armor citadel.

(b) Structural damage.

There is no structural damage in the superstructure. Damage below decks in interior compartments is negligible. Some barbette supports are stressed. The hull has several opened seams in the after trimming tanks, D-12 and D-13.

(c) Other damage.

Flooding has caused some immersion damage aft. Main machinery is operable. Directors, turrets and radar suffered shock damage.

II. Forces Evidenced and Effects Noted.

(a) Heat.

There is no evidence of heat.

(b) Fires and Explosions.

There were no fires or explosions.

(c) Shock.

Underwater shock was sufficient to lift 14-inch shells out of stowage, fracture cast-iron foundations, damage holding-down clips and turret machinery and upset directors.

(d) Directors.

There is no evidence of pressure. Bulkheads topside which were damaged in Test A have somewhat increased damage, probably as the result of wave action.

(e) Any effects apparently peculiar to the Atom Bomb.

Radioactivity is the only peculiar effect.

III. Effects of Damage.

(a) Effect on machinery, electrical and ship control.

Holding-down bolts on the steering pedestal in the steering gear room are sheared. Main machinery and generators are operable.

(b) Effect on gunnery and fire control.

Shock damage has resulted in the inoperability of three 14-inch guns, but all turrets are operable despite damage to holding-down clips. The main battery control director scope foundation is fractured and two directorscopes in the secondary battery control station are badly damaged.

(c) Effect on Watertight integrity and stability.

There are several seam leaks in the hull plating aft. Extensive flooding occurred through bulkheads and piping systems. The watertight integrity of the bulkheads is poor because of the age of the vessel and not as a result of the test. The vessel took a list of 1 1/2 degrees to port but stability was not seriously reduced.

(d) Effect on personnel and habitability.

Shock would have caused numerous casualties. All compartments except those flooded are habitable.

(e) Total effect on fighting efficiency.

Fighting efficiency is considerably impaired by shock damage to turrets and fire control and by flooding in the after spaces.

IV. General Summary of Observers' Impressions and Conclusions.

Shock damage seriously curtailed the fire power of this ship. Poor integrity of watertight bulkheads was largely responsible for progressive flooding. Strength and propulsion are relatively unimpaired.

V. Any Preliminary General or Specific Recommendations.

The type of turret holding-down clip installed on this vessel merits study. The conditions which permitted progressive flooding are fundamentally due to the age of the vessel and antiquated design. No recommendations are made as modern vessels have already received corrective action.

VI. Instructions for loading the vessel specified the following:

ITEM	LOADING
Fuel oil	Minimum
Diesel oil	Minimum
Ammunition	10%
Potable and reserve feed water	95%
Salt water ballast	2230

Details of the actual quantities of the various items aboard are included in Report 7, Stability Inspection Report, submitted by the ship's force in accordance with "Instructions to Target Vessels for Tests and Observations by Ships Force" issued by the Director of Ships Material. This report is available for inspection in the Bureau of Ships Crossroads Files.

DETAILED DESCRIPTION OF HULL DAMAGE

A. General Description of Hull Damage.

(a) Overall condition of vessel.

The overall condition of the hull is good. Several seams have been opened in the extreme stern, resulting in some flooding aft. The principal damage occurred in the gun turrets as the result of shock. Photos, pages 55 to 70 are general views of the ship before and after Test B.

(b) General areas of hull damage.

Hull damage is minor. Several seams have been opened in way of the after trimming tanks. Some shock damage occurred in way of the turrets.

(c) Apparent causes of hull damage in each area.

The primary cause of all hull damage is underwater shock.

(d) Principal areas of flooding with sources.

There are two general areas of flooding. Compartments at the extreme stern of the vessel are flooded through opened seams in the underwater hull and bulkheads having deficient watertight integrity. There is some flooding in the engine rooms and adjacent handling rooms as the result of a leakage through the drainage system.

(e) Residual strength, buoyancy and effect of general condition of hull on operability.

The strength of the hull is unimpaired. Flooding aft has caused a trim by the stern but there is no serious loss in buoyancy. Operability of the vessel would not be impaired by hull damage under normal conditions.

B. Superstructure.

(a) Description of damage.

Structural damage in the superstructure is negligible. A slight aggravation of Test A damage to the bulkheads of the captain's sea cabin on the navigating bridge level is apparent (photo Nos. 2953-10, 2953-12 and 2953-11, pages 94, 96 and 95. There is little, if any, change in the condition of the weather uptake bulkhead under the skirt of the stack. (Photo No. 4222-2, page 97). Damage, not previously reported, has occurred to the air intake louvres on the after bulkhead of the main battery control tower, frame 74, at the superstructure deck level (photo No. 4222-3, page 98). The holding-down bolts connecting the aircraft catapult to turret 3 are loosened. The plane mounted on the catapult has been run forward and upset (photo Nos. 2092-11, 2544-11 and 2544-7, pages 99, 100 and 101). Two ready service boxes on the main deck, starboard side, at about frame 100 have been dislodged (photo No. 2544-10, page 102. The fire control radar antenna on the forward main battery control station has been broken off and is lying on the 20mm gun tubs on the forward side of the foremast (photo Nos. 501-114, 289-70 and 2544-4, pages 57, 70 and 103. Shock caused fractured castings in the directorscopes in the main and secondary battery control stations just abaft the stack (photo Nos. 4222-4 and 4222-5, pages 104 and 105). On the signal bridge shock-mounted radar equipment is dislodged and several electronic tubes broken. General views of the ship are shown in photographs, pages 55 to 70.

(b) Causes of damage in each area.

The principal cause of damage is underwater shock. The airplanes, ready service boxes and air intake louvres may have suffered damage from solid water taken aboard.

(c) Evidences of fire in the superstructure.

There is no evidence of fire.

(d) Estimate of relative effectiveness against heat or blast.

There is no evidence of heat or blast.

(e) Constructive criticism of superstructure design or construction.

Vital equipment in the superstructure should be shock-mounted and constructed of materials not liable to fracture.

C. Turrets, Guns and Directors.

(a) Protected Mounts.

1. General condition, including operability, if known.

The 14'' turrets were damaged by shock. The left gun of turret 2 and the right guns of turrets 3 and 4 are inoperable due to the failure of the elevating screw oscillating bearings. (Photo 2981-1, 2, 4222-6, 7, 8, 9, 10; pages 106 to 112). Since the guns are muzzle heavy the failure permitted them to depress. (Photos 2152-1, 2, 6; pages 78, 71, and 74). The guns affected are all on the port side of the ship which was the side nearest the bomb.

The holding down clips of turrets 3, 4 and 5 are damaged as a result of the turrets having raised from the rollers with considerable force. In turret 3 the rear and right holding down clips have drawn up tightly and are bent outward. In turret 4 the right holding down clip has similar damage while the rear clip has been completely broken off. In turret 5 the rear holding down clip is cracked from the right end to about mid-length, (photo 4164-5; page 113). The left clip in this turret is fracture for a length of about 1'' back from the front end.

The holding down clips in turrets 1 and 2 do not show evidence of failure.

In compartments D36P and D36S under turret 5, the deep frame support under the barbette and stool shows evidence of strain and the web is buckled (photo 4164-2; page 114). This was caused by the underwater shock being resisted by the inertia of the turret and barbette.

Flooding of the lower handling rooms of turrets 4 and 5 is discussed in Item L - Flooding.

Three guns are inoperable. It is not considered that the holding down clip failures would seriously affect operation of the turrets since some of the clips are still intact and the turrets are not restricted in train.

2. Effectiveness of installed turrets or shields.

The turret armor is quite effective protection for the crew and equipment against the effects of the Atomic Bomb. The necessity for improvement in design of these holding down clips and more adequate support for the barbette and turret foundations is indicated.

(b) Unprotected Mounts.

1. General condition, including operability, if known.

No damage.

2. Effectiveness and sufficiency of crew shelters.

Guns in open position do not have adequate protection for the crew from the effects of the Atomic Bomb.

(c) Directors and Range - Finders (In 14" turrets).

1. General condition, including operability, if known.

No damage. Operability not affected.

2. Condition of instrument therein.

No damage.

(d) Constructive criticism of design or construction of mounts, directors, foundations and shelters.

No comment.

D. Torpedo Mounts, Depth Charge Gear.

Not applicable.

E. Weather Deck.

No damage observed.

F. Exterior Hull (Above Waterline).

No damage observed other than the failure of the connections of the port quarter boat boom to the hull as the result of shock and wave disturbances. The boom is broken.

G. Interior Compartments (Above Armor Deck).

(a) Damage to structure and causes.

There is very slight indications of stresses in structural members. Frames under the main deck at about frame 65, port side, show signs of slight working.

(b) Damage to joiner bulkheads and causes.

Damage to joiner bulkheads is insignificant. In a few cases, gear on deck has been thrown against joiner bulkheads, causing small dents.

(c) Details of damage to access closures and fittings.

There is no damage to access closures or fittings.

(d) Condition of equipment within compartments.

Equipment in the compartments showed signs of slight shock and a large amplitude roll of the ship. Bunks in crews living spaces are still on their hooks. Occasional lockers have been thrown down. In the sick bay area, considerable gear is on the deck. A

broken mirror and bottles from a medicine cabinet are lying at frame 31, port side, on the second deck. A bookshelf is off its supporting clips at frame 41. In compartment D-109, a ten foot section of four-inch ventilation duct has fallen down.

(e) Evidence of fire.

There is no evidence of fire.

(f) Damage in way of piping, cables, ventilation ducts, etc.

Piping and cable penetration of bulkheads are not damaged.

(g) Estimate of reduction in watertight subdivision, habitability and utility of compartments.

No reduction in watertight subdivision, habitability or utility of compartments above the armor deck occurred.

H. Armor Deck.

(a) Damage to armor deck and cause of damage.

There is no apparent damage to the armor deck proper. At the after termination of the second deck armored portion at frame 122 1/2, starboard, a slight weld failure has occurred in the fairing plate connecting the armored and unarmored portions, apparently as the result of shock. The deck deflection gauge at frame 123, second deck, indicates a motion under shock of one inch upward, 3/16 inch downward and 1/2 inch to the port side.

(b) Protection afforded spaces below.

Not applicable.

(c) Condition around openings.

Excellent.

(d) Condition of connection to vertical armor.

Excellent.

I. Interior Compartments (Below waterline).

(a) Damage to structure and causes.

There is some minor damage to a deep girder column supporting the barbette and stool of Mount 5 in compartment D-36-MS at frame 118. The column shows evidence of compressive loading (photo No. 4164-2, page 114). Web frames in the sanitary pump and marine stores compartment, D-26-P, are distorted in way of shell failures. Damage to shell plating is described in Item J.

(b) Damage to joiner bulkheads and causes.

No damage observed.

(c) Details of damage to access closures and causes.

No damage occurred to access closures generally. Several watertight doors in the after portion of the vessel were loosened or undogged by shock, allowing progressive flooding of many spaces.

(d) Condition of equipment within compartments.

Equipment shows evidence of shock loadings. Lumber and pipes are moved in stowages. The cast iron foundation of exhaust blower S-79-1, located in the after dynamo room, C-24, has fractured at all four connections, dropping the blower motor from the overhead (photo Nos. 2953-8 and 2953-9; pages 115 and 116). The holding down bolts on the steering pedestal in the steering engine room are sheared. Holding down bolts are loosened on heavy equipment, such as evaporators and condensers.

(e) Flooding.

Flooding is fully described in Item L.

(f) Damage in way of piping, cables, ventilation ducts, shafts, etc.

There is no apparent damage to piping, cable and ventilation penetration of bulkheads. The steering gear room, D-27, is flooding through the rudder port gland, through a sheared reach rod deck fitting and through a ruptured drain line to D-12. In addition, considerable progressive flooding has occurred through watertight bulkheads through unplugged cable and pipe holes, etc. These deficiencies are the result of the age and condition of the vessel rather than test damage.

(g) Estimate of reduction in watertight subdivision, habitability and utility of spaces.

Watertight subdivision is reduced somewhat in the after portion of the vessel. Those compartments which have flooded have severely reduced habitability and utility.

J. Underwater Hull.

(a) Interior inspection of underwater hull.

It is not possible to make an interior inspection of the underwater hull. A diver's inspection has been made of the portion of the vessel aft of frame 100. The major damage is reported to have occurred at the port side between frames 108 and 112. The tenth strake above the keel has been pushed inboard, pulling out rivets and opening the faying surfaces at both the upper and lower seams as much as two inches. The opened seams are about eighteen feet long. On the starboard side, a butt has failed in "E" strake at frame 125, pulling out rivets and leaving a one inch opening between faying surfaces.

(b) Effect of damage on buoyancy, operability, maneuverability.

There is very little effect on buoyancy, operability and maneuverability.

(c) Any known or suspected damage to:

1. Shafts and propellers.

No apparent damage.

2. Struts.

No apparent damage.

3. Rudders.

No apparent damage.

4. External keels.

At the after end of the centerline skeg, the side plates are distorted and some rivets are pulled out. The after end of the starboard auxiliary docking keel is distorted and its connection to the hull is opened at frame 114.

(d) Details of impairment of keel structure.

The keel structure is believed to be undamaged.

K. Tanks.

(a) Condition of tanks in areas of damage.

The after trimming tanks, D-12 and D-13, are flooded thru an opened shell butt connection at frame 125. An open seam between frames 108 and 112 on the port side has resulted in the flooding of D-92-F and D-94-F. It is possible that D-92-1-V, D-92-F and D-94-F. It is possible that D-92-1-V, D-93-F, D-94-1V, D-95-F, D-95-1V and D-96-1V are flooded or contaminated.

(b) Contamination of liquids.

Contaminated tanks are limited to those listed above and are due almost entirely to leaks in the shell plating. The contamination has little effect on the operability of the vessel.

(c) Damage to torpedo systems.

No damage to torpedo systems is known or suspected.

L. Flooding.

(a) and (b) Description of flooding and causes.

The principal causes of flooding are opened shell seams and rudder trunk leakage. Secondary causes are non-tight bulkhead boundaries wiring stuffing tubes, open bolt holes in bulkheads and decks, doors and hatches jarred loose, torn deck plating, steering shaft bulkhead glands, and piping systems.

	Drafts	List
Before Test	Fwd. 28' - 0" Aft. 30' - 1"	0°
After Test	Fwd. 25' - 6" Aft. 33' - 6"	1 1/2° Port

A diver's inspection of the underwater hull revealed several openings. On the port side from frame 108 to 112, between the bilge keel and the auxiliary keel, one strake of plating is pushed in at frame 110, opening both seams about 2 inches. This probably flooded D-92-F, D-94-F, D-92-1-V, D-93-F, D-94-1-V, D-95-F, D-95-1-V, and D-96-1-V. An opening in the "E" strake at frame 125 starboard flooded D-12.

The forward Peak Tank, A-1, and the Forward Drainage Tank, A-12 are flooded. The Crews Space, D-109, has 8 inches of water on deck from an undetermined source. The CPO Mess, D-112 has partial flooding which may have come from D-27 and D-103 through the bolted rudder post access plates.

The following spaces are flooded by water which entered through the rudder trunk and trimming tanks, D-12 and D-13, which are open to the sea.

The Steering Gear Room, D-27, is flooded through the rudder post gland from D-13, through a sheared reach rod deck fitting, and is connected to D-12 through a ruptured drain line. D-27 is connected by a common gravity drain line to other spaces and to the starboard engineroom where the drain valve is closed. The Steering Room, D-25, flooded from D-12 through the drain line and a torn steering foundation pad on the deck. Leakage also came from D-27 around the steering shaft glands and through the loosened door.

The After 14" magazine spaces have been flooded by water backing up through the common gravity drain line, and then through doors and bulkheads having deficient watertight integrity. In this fashion D-29, D-30-M-P, D-31-M-P, D-32, D-34-M-P, D-35, D-36-M-P, and D-37 have flooded to an average depth of 4 feet. Water from D-29 also is leaking into the Steering Engine Room, C-1 through deck wiring stuffing tubes. Improvement in design of deck drain valves appears to be indicated.

Water from D-25 flooded the Sanitary Pump Rooms D-26-P and D-26-S through loosened doors. Water also flowed forward into the 5-inch magazines through bulkheads having poor watertight integrity. In addition, water came from the Steering Engine Room, C-1. This water passed through loosened doors and bulkheads pierced by the Steering Control Rod. Compartments D-15, and D-24-M were flooded to an average of about 4 feet. Water escaped from D-24-M through the deck hatch at frame 122 and flooded the Marines Stores, D-11, to a depth of 4 feet.

Water entering the Steering Engine Room, C-1, has leaked into the Wiring Passage, C-17, the engine rooms, and down into the Engineers Stores, D-1. The starboard engine room has about 4 1/2 feet and the port engineroom has about 1 1/2 feet of water.

Water has leaked from the starboard engineroom into Engineer Storerooms D-3 and D-9 through doors which had loose dogs.

(c) List of compartments believed to have flooded slowly.

All flooding could have been controlled by ship's force and isolated in the compartments with opened seams.

M. Ventilation.

Damage to ventilation is very minor. Comment on the performance of the ventilation system is not necessary because of the age of the design of the system installed on this vessel.

N. Ship Control.

(a) Damage to ship control station and causes.

The main gyro is inoperable and several radar installations in C.I.C. are dislodged from the bulkhead. There is some flooding in the steering gear room and the bolts or the steering pedestal are sheared.

(b) Constructive criticism of ship control systems.

Exposed ship control equipment should be moved within protective enclosures.

O. Fire Control.

(a) Damage to fire control stations and causes.

1. Directors and elevated control positions.

The foundation for the director ope of the main battery after control station was fractured by shock. The director-scope was seriously damaged and rendered inoperable. The two directorscopes of the secondary battery control aft were destroyed. The training base plates of both directorscopes were fractured and the training gear and scope foundations were displaced.

The directors on the mainmast and foremast were undamaged and operable.

2. Plot rooms and protected spaces.

No damage.

(b) List of stations having insufficient protection and estimated effect on fighting efficiency of the loss of each.

All topside stations with the exception of the conning tower have insufficient protection for instruments and personnel.

(c) Constructive criticism of location and arrangement of stations.

No comment.

P. Ammunition Behavior.

(a) Ready service ammunition, location, protection, behavior under heat and blast.

In turrets 4 and 5, projectiles stowed in racks at the projectile transfer level are considerably disarranged as a result of shock, (Photos 4164-4, 4222-11, 12; pages 117, 118 and 119). On the mainmast AA machine gun platform, 20MM magazines were thrown from stowage on bulkheads.

(b) Magazines, location, protection, forces involved, behavior.

14" projectiles in magazines D36D and D36S were displaced by shock, (photo 4164-3, page 120).

(c) List of stowages which are insufficiently protected and effects on ship survival of explosion of each stowage.

All below deck stowages seem to be well protected so that no ammunition became unstable during the test. Stowages should be designed to retain the ammunition in place when the ship receives a severe shock.

(d) Behavior of gasoline stowage facilities.

No casualties reported to gasoline stowage facilities.

Q. Ammunition Handling.

(a) Condition and operability of ammunition handling devices.

Condition good. Operability not affected.

(b) Evidence that any ammunition handling devices contributed to passing of heat, fire, blast or flooding water.

None.

(c) Constructive criticism of design and construction of ammunition handling devices.

No comment.

R. Strength.

The strength of the hull is not impaired. Cast foundations suffered from shock.

S. Miscellaneous.

No comment.

TECHNICAL INSPECTION REPORT

SECTION II - MACHINERY

GENERAL SUMMARY OF MACHINERY DAMAGE

I. Target Condition After Test.

(a) Drafts after test; list; general areas of flooding, sources.

The following spaces containing machinery were flooded: Starboard shaft alley, electric steering gear room; after diesel room. It is believed that all of this flooding could have been controlled if the crew had been aboard.

(b) Structural damage.

No comment.

(c) Damage: machinery and ship control.

The casings of boilers 3 and 4 received minor damage, being parted at joints. The electric steering system, after emergency diesel generator, and after diesel fire pump were damaged by flooding. The after auxiliary condenser and both distilling units show evidence of considerable momentary displacement. They may have internal leaks, but no damage is apparent from visual inspection. There is a considerable amount of minor damage throughout the machinery spaces, such as minor leaks in piping, gages disarranged, water column gages (glass) broken, etc.

II. Forces Evidenced and Effects Noted.

(a) Heat.

No evidence.

(b) Fires and explosions.

No evidence.

(c) Shock.

The NEW YORK received an underwater shock of high magnitude, which shock and the resultant whipping motion of the ship caused most of the damage to the machinery installation. Leads left in two of the main bearings of the port main engine indicate momentary displacement of crankshaft of the order of the .016 inch, which is additional evidence of heavy shock.

(d) Pressure.

No evidence.

(e) Any effects apparently peculiar to the atom bomb.

An underwater shock of such high magnitude at this distance from an explosion plus the violent displacement of the ship, is apparently peculiar to the atom bomb.

III. Effects of Damage.

(a) Effect on machinery, electrical, and ship control.

Damage to boilers 3 and 4 made them inoperable, but repairs could have been made by the ship's force within 4 hours. The after auxiliary condenser and the main distilling plant may have been made temporarily inoperable by tube leaks. Some non-vital machinery is inoperable because of flooding, which could probably have been controlled if the crew had been aboard. As the steam steering engine is operable, flooding of the electric steering system would not have impaired operation of the ship.

(b) Effect on gunnery and fire control.

No comment.

(c) Effect on watertight integrity and stability.

No comment.

(d) Effect on personnel and habitability.

It is estimated that there would have been few, if any, casualties to personnel below decks. Habitability was not affected except for radioactivity.

(e) Total effect on fighting efficiency.

Maximum speed would have been reduced to about 18 knots for a few hours while boilers 3 and 4 were being repaired. It is not believed that the test would have had any other effect on fighting efficiency as far as machinery is concerned.

IV. General Summary of Observers' Impressions and Conclusions.

It is not believed that the boilers of a modern battleship would have been damaged by a shock such as the NEW YORK received. However, a main turbine in operation receiving a shock sufficient to cause movement of the rotor of like magnitude (.018 inch maximum) would probably be damaged. The NEW YORK has reciprocating engines.

V. Any Preliminary General or Specific recommendations of the Inspecting Group.

As the machinery of the NEW YORK is of obsolete design no specific recommendations based on her experience would be pertinent. However, the general recommendation is submitted that every effort be made to improve the resistance of naval machinery to shock.

DETAILED DESCRIPTION OF MACHINERY DAMAGE

A. General Description of Machinery Damage.

(a) Overall condition.

Nos. 3 and 4 boilers were inoperable after the test because of casings being parted. The damage on boiler No. 3 was repaired within two hours by the ship's force. The electric steering system, after diesel generator, and after diesel fire pump are out of commission because of flooding. It is believed that this flooding could have been controlled if the crew had been aboard. No. 2 auxiliary condenser and the evaporators may have tube leaks but appear to be undamaged from visual inspection. Their foundations show evidence of considerable motion. Otherwise it is believed that all units could be operated.

(b) Areas of major damage.

There was no major damage to machinery on this vessel.

(c) Primary causes of damage.

Flooding, minor damage by shock.

(d) Effect of target test on overall operation of machinery plant.

It is believed that if the crew had been on board, the flooding could have been controlled. In this case no machinery would have been made inoperable except #3 and #4 boilers, which could have been quickly repaired. No. 2 auxiliary condenser and the evaporators might also have been made temporarily inoperable. There would probably have been a few personnel casualties because of shock and flarebacks in the firerooms.

B. Boilers.

No major damage to boilers resulted from test B but the casings of boilers #3 and #4 have minor damage and the plastic peaks in some boilers were dislodged. Repairs to boiler #3 were affected by the ship's force in about 2 hours. Boiler #3 was lighted off and steamed daily for five days after test B. No repairs to brickwork are necessary immediately except on boiler #2, but eventually these peaks would have had to have been replaced.

(a) Air casings.

Side casing panels of all boilers are loose at toggle joints. On boilers 3 and 4 the casing panels had been pushed outward about 4 inches at the toggle joints. (Photographs 4163-7, page 121 and 4163-8, page 122).

(b) External fittings.

No damage.

(c) Fuel oil burner assemblies.

No damage.

(d) Brickwork and furnaces.

The plastic at the peaks of the front and back walls is loose on all boilers, and had fallen out on #2 boiler. (Photograph 4163-6, page 123).

(e) Steam, water drums, and headers.

No damage.

(f) Tubes.

No damage.

(g) Foundations.

No damage.

(h) Stacks and uptakes:

No damage.

C. Blowers.

The forced draft blowers are undamaged insofar as can be determined by visual inspection. They all turn freely by hand. Number three blower has been used for five days while steaming #3 boiler, operation satisfactory.

D. Fuel oil Equipment.

There is no apparent damage to fuel oil equipment. The equipment in #2 fire room has been operated satisfactorily since test B.

E. Boiler Feedwater Equipment.

The feedwater equipment is undamaged. Most of it has been used in service since test B, operation satisfactory.

F. Main Engine (Reciprocating).

The main engines are undamaged insofar as can be determined from visual inspection. Leads left in two of the bearings of the port main engine indicate considerable movement (maximum approximately .018 inches) of the crankshaft at the time of the test. (See bearing lead data below).

BEARING LEAD DATA

PORT ENGINE - #1 MAIN BEARING - FORWARD INBOARD

No. 1 lead	Before test B	After test B	Difference
Port	.020	.007	.013
Top	.023	.012	.011
Starboard	.020	.009	.011

No. 2 lead	Before test B	After test B	Difference
Port	.016	.008	.008
Top	.023	.006	.017
Starboard	.019	.010	.009

PORT ENGINE - #1 MAIN BEARING - FORWARD INBOARD

No. 3 lead	Before test B	After test B	Difference
Port	.015	.008	.007
Top	.023	.005	.018
Starboard	.018	.010	.008
No. 4 lead			
Port	.018	.006	.012
Top	.021	.0065	.0145
Starboard	.019	.009	.010
No. 5 lead			
Port	.018	.005	.013
Top	.0175	.006	.0115
Starboard	.012	.010	.002
No. 6 lead			
Port	.019	.006	.013
Top	.0165	.007	.0095
Starboard	.014	.013	.001

PORT ENGINE - #7 MAIN BEARING - FORWARD INBOARD

No. 1 lead			
Port	.010	.005	.005
Top	.016	.006	.010
Starboard	.011	.006	.005

No. 2 lead	Before test B	After test B	Difference
Port	.011	.0065	.0045
Top	.015	.006	.009
Starboard	.013	.0055	.0075
No. 3 lead			
Port	.011	.005	.006
Top	.0155	.006	.0095
Starboard	.014	.006	.008
No. 4 lead			
Port	.012	.0045	.0075
Top	.017	.006	.011
Starboard	.011	.0065	.0045
No. 5 lead			
Port	.010	.0055	.0045
Top	.016	.006	.010
Starboard	.013	.0065	.0065

G. Reduction Gears.

Not applicable.

H. Shafting and Bearings.

The starboard shaft alley was flooded to about the centerline of the shaft but there was no apparent damage to shafting or bearings. The water apparently entered around the shaft glands.

I. Lubrication System.

There was no damage apparent from a visual inspection that would make the lubrication system inoperable.

(a) Coolers.

No damage.

(b) Filters and strainers.

No damage.

(c) Purifiers.

No damage.

(d) Tanks, (Sump, Settling, etc).

The outboard of the two settling tanks in each engine room was jarred upward but returned to its foundations without damage.

(e) Fittings.

The column gages on the outboard settling tank in each engine room was broken and the bottom fitting bent downward. A lube oil gage connected to the starboard crankpit had the pointer pushed past the stop pin.

J. Condensers and Air Ejectors.

Number one auxiliary condenser is the only one that has been operated since test B. Its operation was normal.

(a) Water boxes.

No damage.

(b) Shell and shell connections.

A leak in the overboard connection to #1 auxiliary condenser, which had been brazed before test B, was reopened. The shell of #2 auxiliary condenser had moved off its forward foundation, tending to break away from the holding down bolts, but returned to its original position. It is not believed that this would impair

operation although the condenser has not been tested and may have leaks.

(c) Expansion joints.

No damage.

(d) Air ejectors.

Not applicable.

(e) Inter and after condensers.

Not applicable.

(f) Miscellaneous valves, fittings, etc.

No damage.

The main condensers are undamaged, insofar as can be determined by visual inspection.

K. Pumps.

Approximately half of all the pumps on the ship have been operated since test B. All that were operated functioned normally.

(a) Feed pumps.

No apparent damage. Number two auxiliary feed pump has been operated since test B.

(b) Circulating pumps.

No apparent damage.

(c) Condensate pumps.

No apparent damage. Pumps to #1 dynamo plant have been operated since test B.

(d) Fire pumps.

The after diesel fire pump was flooded. The forward diesel fire pump and #1 fire and bilge pump were operated satisfactorily after test B. There is no apparent damage to other fire pumps.

(e) Lube oil pumps.

No apparent damage.

(f) Fuel oil pumps.

No apparent damage. The electric (port use) pump in #2 fire room, and #1 fuel oil booster pump, were operated satisfactorily after test A.

(g) Other pumps.

No apparer' damage.

L. Auxiliary Generators (Turbine and Gears).

No apparent damage. Number two generator has been operated for five days, and number one has been turned over by hand, since test B.

M. Propellers.

The propellers were inspected by a diver on 15 August and found to be undamaged.

N. Distilling Plant.

The distilling condensers showed evidence of shock (see below). There was no apparent damage (except grounding of a brine overboard motor) that would have affected operation, however, there may be leaks in the tube nests.

(a) Evaporators.

The foundation bolts (which are simple tap bolts with

a flat washer) were stretched and loosened on the 2nd and 3rd effects, starboard unit, and all three effects, port unit.

(b) Distilling condensers.

No apparent damage.

(c) Evaporator feed heaters.

No apparent damage.

(d) Miscellaneous valves, fittings, etc.

The motor of the starboard brine overboard pump was grounded out by water leaking from a leaking firemain connection nearby.

O. Refrigerating Plant.

The refrigerating plant was undamaged, insofar as could be determined by a careful visual inspection.

P. Winches, Windlasses and Capstans.

There was no apparent damage to equipment included in this item, none of which has been operated since test B.

Q. Steering Engine.

The electric steering room was flooded and all equipment grounded out. The steam steering equipment was undamaged insofar as could be determined by visual inspection.

(a) Foundations.

The holding down bolts of the shifting clutch pedestal were sheared, allowing the space to flood from the flooded handling room below.

(b) Ram, quadrant, chaines, screws, etc.

No apparent damage.

(c) Hydraulic system, including pumps, piping, etc.

Not applicable.

(d) Follow up system.

Not applicable.

(e) Motors or engines.

Motors, flooded, engine apparently undamaged.

(f) Miscellaneous (Steering stands, gages, etc).

No apparent damage.

R. Elevators, Ammunition Hoists, etc.

There is no apparent damage to the upper level mechanism of the 5'' hoists. The lower level mechanism of the after 5'' hoist was flooded.

Both cranes were operated satisfactorily since test B, and are undamaged.

S. Ventilation (Machinery.

There is no apparent damage to ventilation machinery, most of which has been operated since test B.

T. Air Compressors.

The air compressors are undamaged insofar as could be determined by visual inspection.

U. Diesels (Generators and Boats).

1. The forward diesel generator and diesel fire pump have been operated since test B and are undamaged.

2. The after diesel generator and diesel fire pump were flooded. They do not appear to have received any mechanical damage.

3. No power boats were aboard during test B.

V. Piping.

(a) Main steam.

No apparent damage. The main steam piping in the fire rooms has been tested since test B.

(b) Auxiliary Steam.

There is no damage to auxiliary steam piping, all of which has been tested and some of it used in service since test B.

(c) Auxiliary exhaust.

There is no damage to auxiliary exhaust piping, all of which has been tested and some of it used in service since test B.

(d) Condensate and feedwater.

No apparent damage. Most of the feedwater piping has been used in service since test B.

(e) Fuel.

There is a small leak at a bend in the discharge line from #1 fuel oil booster pump. This does not appreciably affect operation. About 1/10 of the fuel oil piping has been used since test B. The system appears to be substantially intact.

(f) Lube oil.

No apparent damage.

(g) Firemain, sprinkling, and water curtain.

An outlet connection to the starboard main in the evaporator rrom failed at the weld of the flange. There is no other damage to the firemain system, which has been in use since test B.

(h) Condenser circulating water.

No apparent damage.

(i) Drain.

No apparent damage.

(j) Compressed air.

No apparent damage.

(k) Gasoline.

No apparent damage.

W. Miscellaneous.

(a) Gasoline stowage and equipment.

No apparent damage.

(b) Messing machinery.

No apparent damage.

(c) Messing equipment.

No apparent damage.

(d) Laundry equipment.

No apparent damage.

(e) Machine ship equipment.

No apparent damage.

TECHNICAL INSPECTION REPORT

SECTION III - ELECTRICAL

GENERAL SUMMARY OF ELECTRICAL DAMAGE

I. Target Condition After Test.

(a) Drafts; list; general areas of flooding, sources.

Drafts not observed.

Steering gear room and after emergency generator room were flooded. Cause of flooding was not observed. Other areas of flooding were not noted.

(b) Structural damage.

Not observed.

(c) Operability.

Emergency generator and steering motors were disabled by flooding.

Both master gyro compasses were damaged by failure of sensitive element suspension springs and spilling of mercury.

II. Forces Evidenced and Effects Noted.

(a) Heat

There was no evidence of heat.

(b) Fires and explosions.

There was no evidence of fire or explosions.

(c) Shock.

The damage to both master gyro compasses and the broken casting on the dynamo room vent set indicates the presence of shock.

(d) Pressure.

No evidence of pressure was observed.

(e) Any effects apparently peculiar to the atom bomb.

The only effect peculiar to the atom bomb was the persistant high radioactivity of the exposed areas.

III. Results of Test on Target.

(a) Effect on propulsion and ship control.

Electrical failures would have had no effect on propulsion or ship control.

(b) Effect on gunnery and fire control.

The failure of both master gyro compasses would have seriously affected fire control.

(c) Effect on watertight integrity and stability.

Watertight integrity and stability was not impaired by any electrical failures.

(d) Effect on personnel and habitability.

Electrical failures had no effect on personnel or habitability of the vessel.

(e) Effect on fighting efficiency.

Damage to both master gyro compasses would have seriously affected fire control.

IV. General Summary of Observers' Impressions and Conclusions.

The Arma Mk VIII Mod. 3A gyro compass stands out as a critical weakness in the electrical equipment of modern ships.

V. Any Preliminary General or Specific Recommendations of the Inspecting Group.

Gyro compasses require modification and improvement to make them equal in damage resistance to other electrical equipment.

DETAILED DESCRIPTION OF ELECTRICAL DAMAGE

PART C

A. General Description of Electrical Damage.

(a) Overall condition.

There was slight damage to electrical equipment from shock and flooding.

(b) Areas of major damage.

After machinery spaces, navigation bridge and searchlight platform.

(c) Primary causes of damage in each area of major damage.

Primary cause of damage in lower deck spaces was caused by flooding. Weatherdeck damage was from water falling back on the vessel and water used by the decontamination party.

(d) Operability of electric plant.

Only part of the electrical plant was given an operational test, the remainder was visually inspected. The primary damage found was from flooding.

(e) Types of equipment most affected.

Gyro compasses received damage from shock. All submerged equipment was water damaged.

B. Electric Propulsion Rotating Equipment.

1. This item does not apply.

C. Electric Propulsion Control Equipment.

1. This item does not apply.

D. Ship's Service Generator.

1. No damage was found by inspection or operation.

E. Emergency Generators.

1. The after emergency generator was flooded with salt water. There is no indication of any other damage.

F. Switchboards and Distribution Panels.

1. The only damage to switchboard or distribution panels was from salt water flooding.

G. Wiring, Wiring Equipment and Wireways.

1. Cables in flooded compartment were grounded. No damage other than flooding was noted.

H. Transformers.

1. There was no damage to any transformers.

I. Submarine Propelling Batteries.

1. This item does not apply.

J. Portable Batteries.

1. There was no damage to portable batteries.

K. Motors, Motor Generator Sets and Motor Controllers.

1. The cast iron mounting bracket for a vent set located in the after dynamo room was broken by shock. Both boat cranes had grounded controllers and motors. This was the result of water falling back on the ship or from the decontamination process.

L. Lighting Equipment.

1. Fluorescent lighting fixtures installed in the operating room had the tubes jarred from the fixture and broken. Opal glass globes in the after part of the vessel were shattered.

M. Searchlights.

1. Both 36 inch searchlights were found to have additional damage after Test B. No. 2 light lost its dome glass. It is not known whether the glass was broken as a result of shock or from the high pressure fire hoses used by the decontamination teams. All the moving parts in both lamps were frozen from salt water corrosion, this no doubt was a result of decontamination work.

N. Degaussing Equipment.

1. No damage was found to any degaussing equipment.

O. Gyro Compass Equipment.

1. Both master gyro compasses had suspension springs pulled free and elongated permitting the sensitive element to swing out of the vertical and to collide with the bottom of the binnacle case. Both compasses spilled a small amount of mercury from the flotation bowl. All other gyro equipment was found to be undamaged.

P. Sound Powered Telephones.

1. No damage.

Q. Ship's Service Telephones.

1. No damage.

R. Announcing Systems.

1. No damage.

S. Telegraphs.

1. All telegraphs and instruments on navigation bridge were grounded by salt water from decontamination process.

T. Indicating Systems.

1. All indicating systems exposed on open decks grounded by decontamination work. Indicating systems below deck not affected.

U. I.C. and A.C.O. Switchboards.

1. No damage.

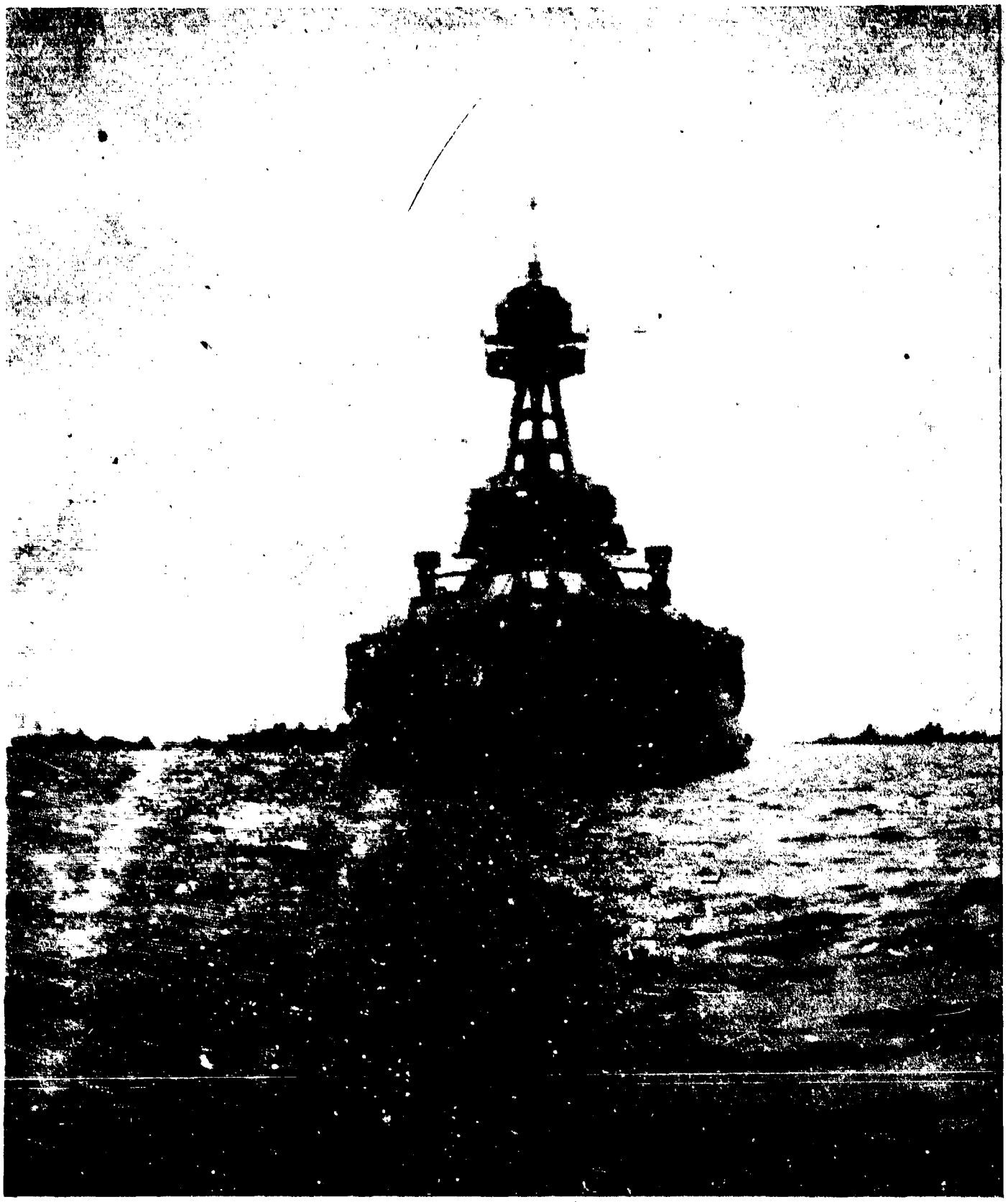
V. F.C. Switchboards.

1. No damage.

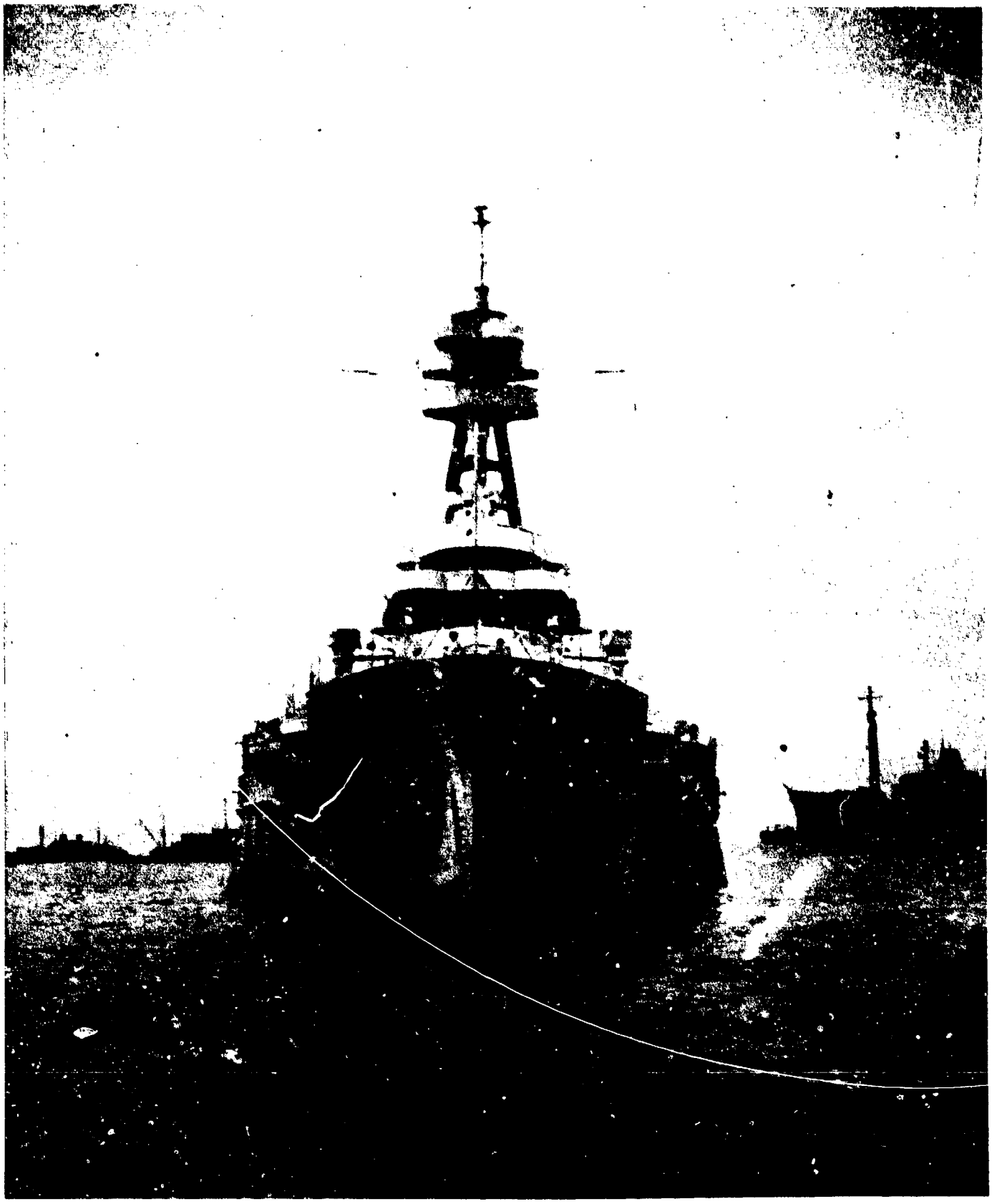
SECTION IV

PHOTOGRAPHS

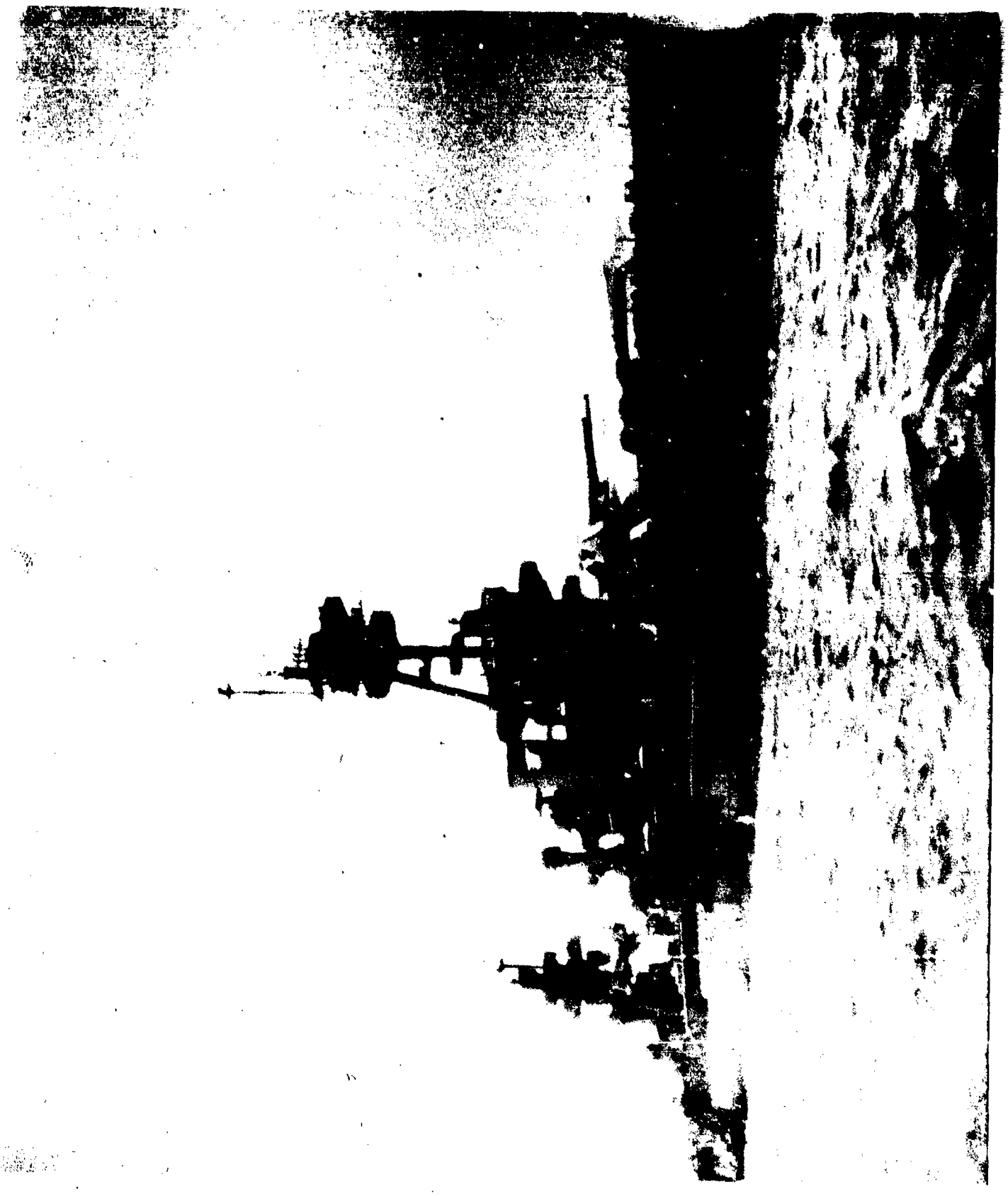
TEST BAKER



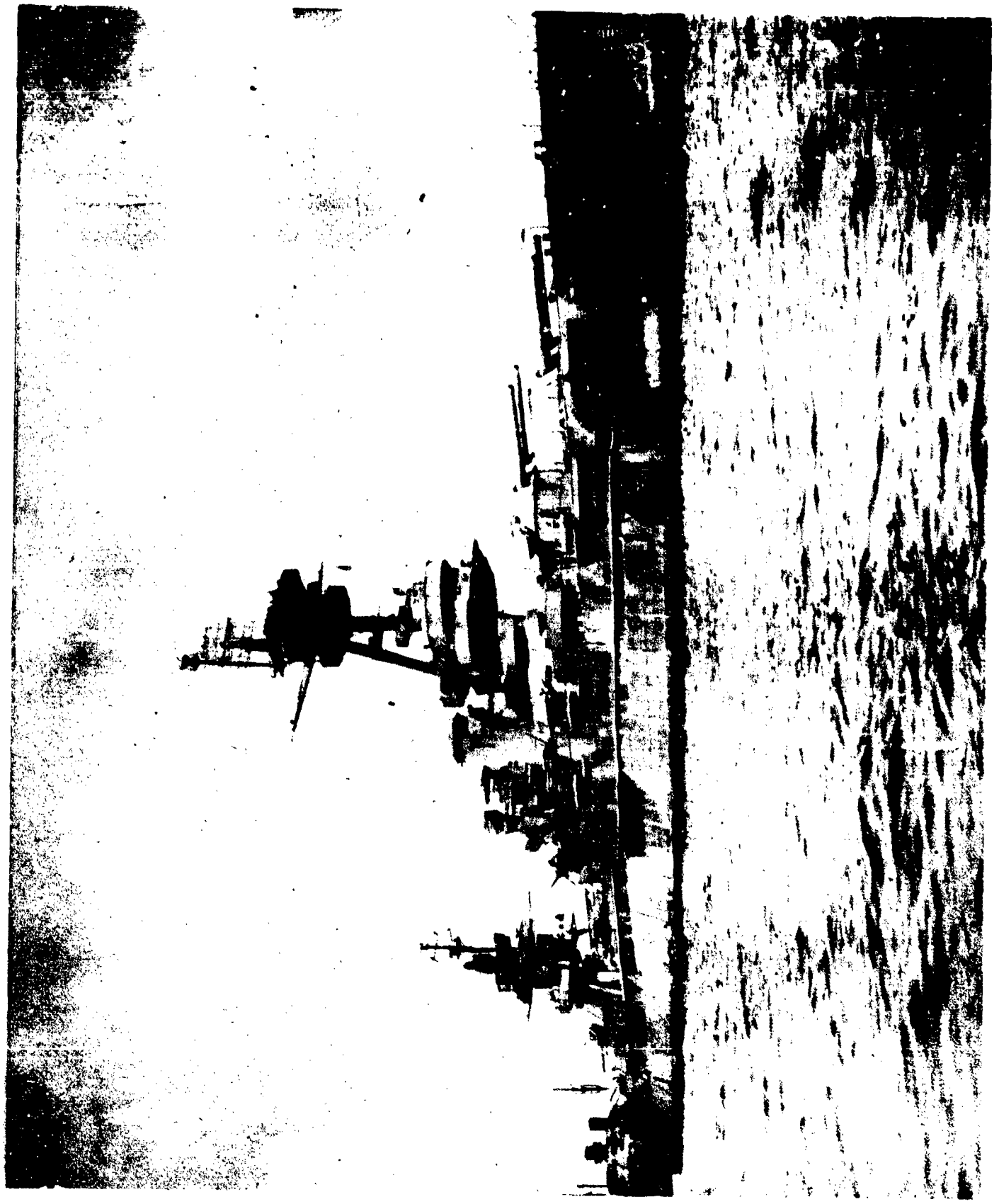
BB-CR-227-501-115. View from dead ahead before Test B.



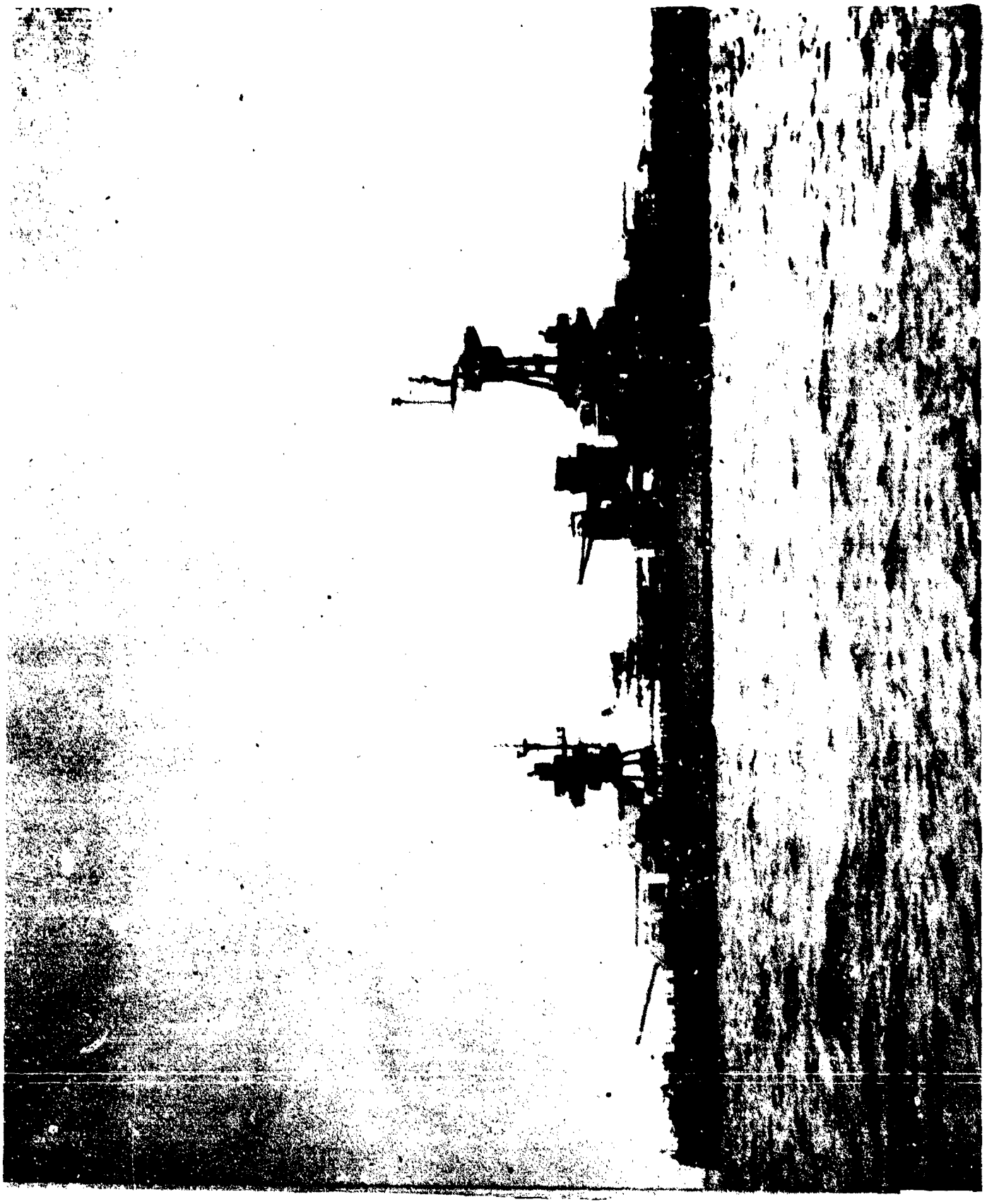
AB-CR-227-289-69. View from dead ahead after Test B.



BB-CR-227-501-114. View from off starboard bow before Test A.

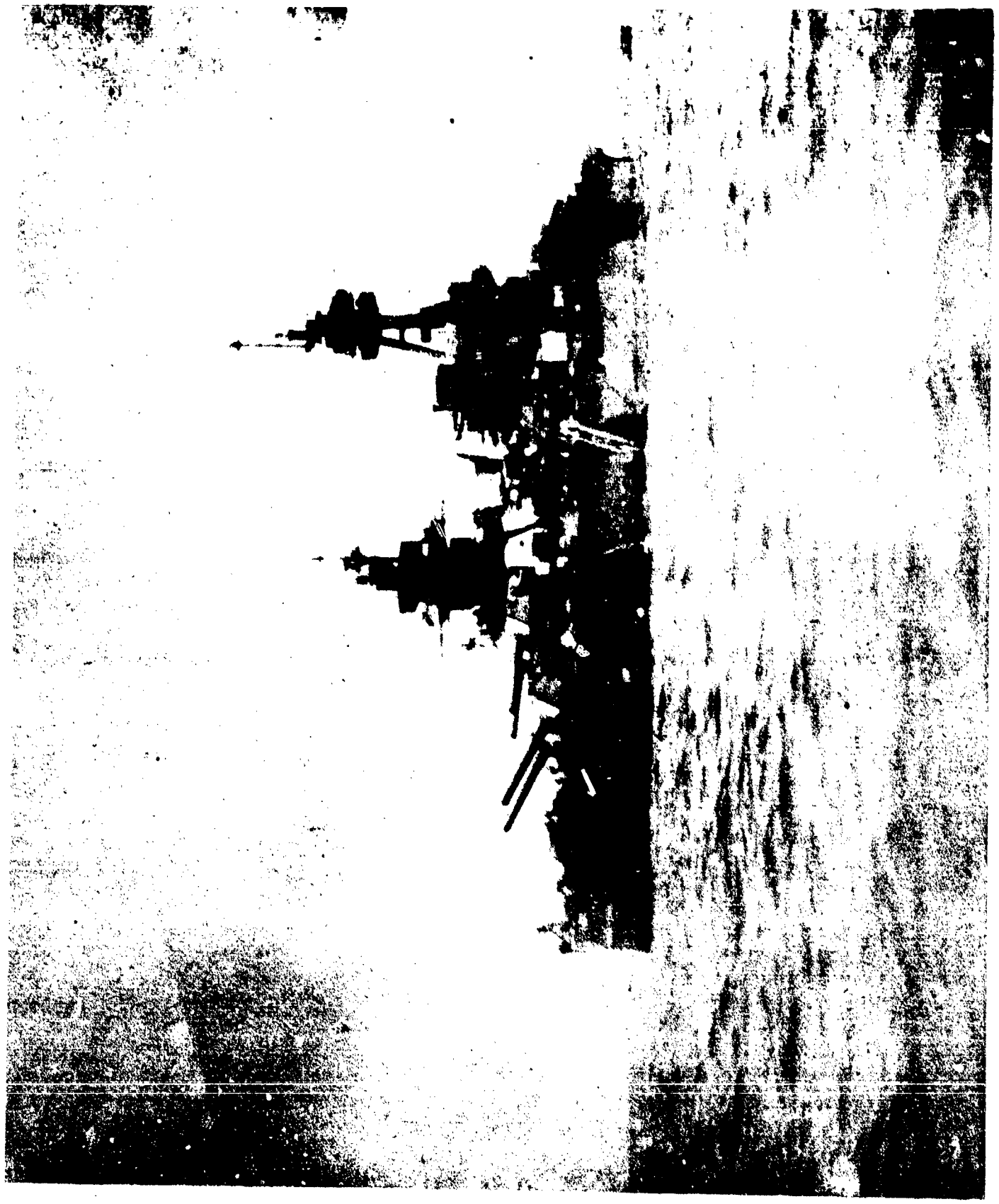


AB-CR-227-289-68. View from off starboard bow after Test B.

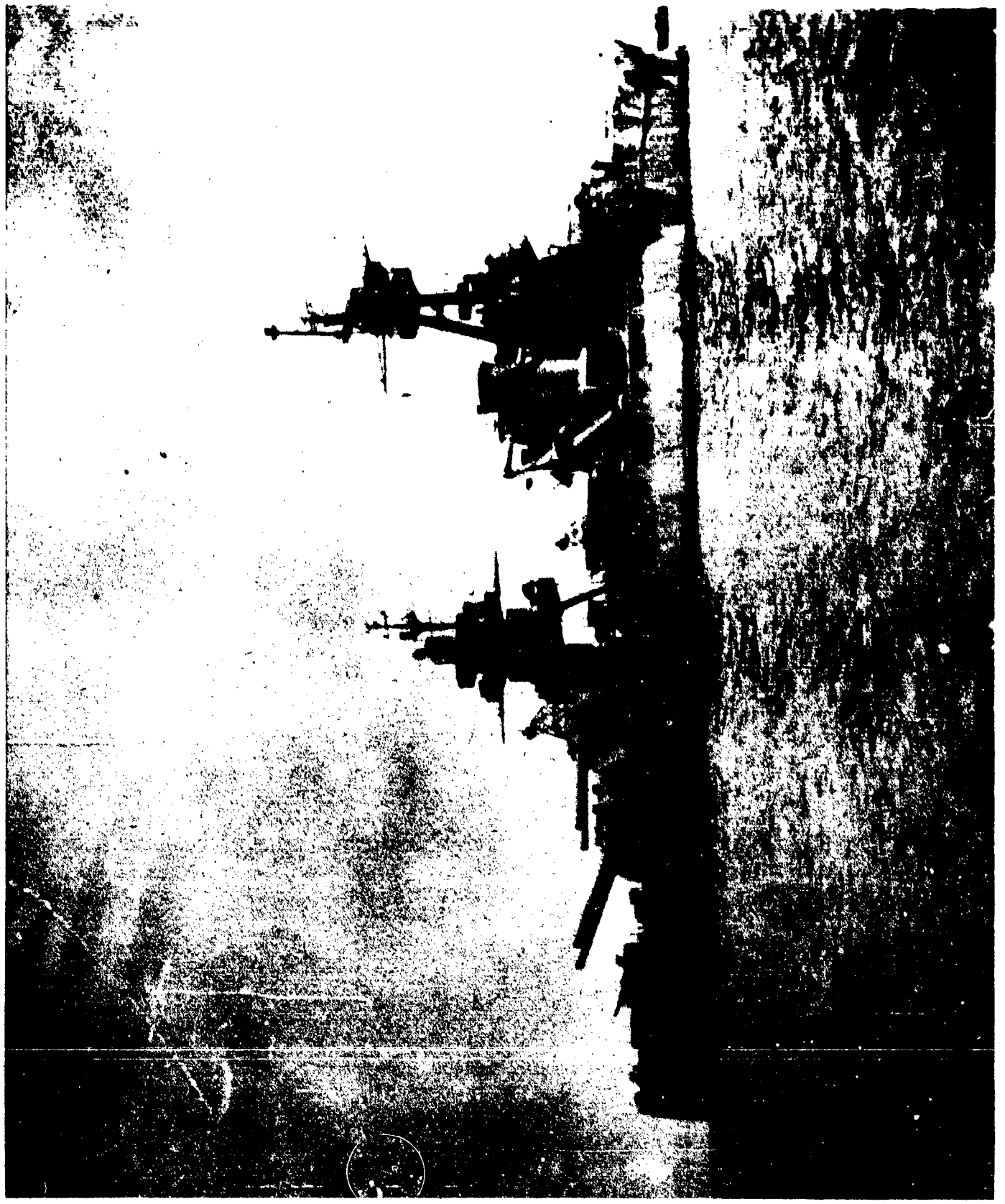


BB-CR-227-501-113. View from off starboard beam before Test B.

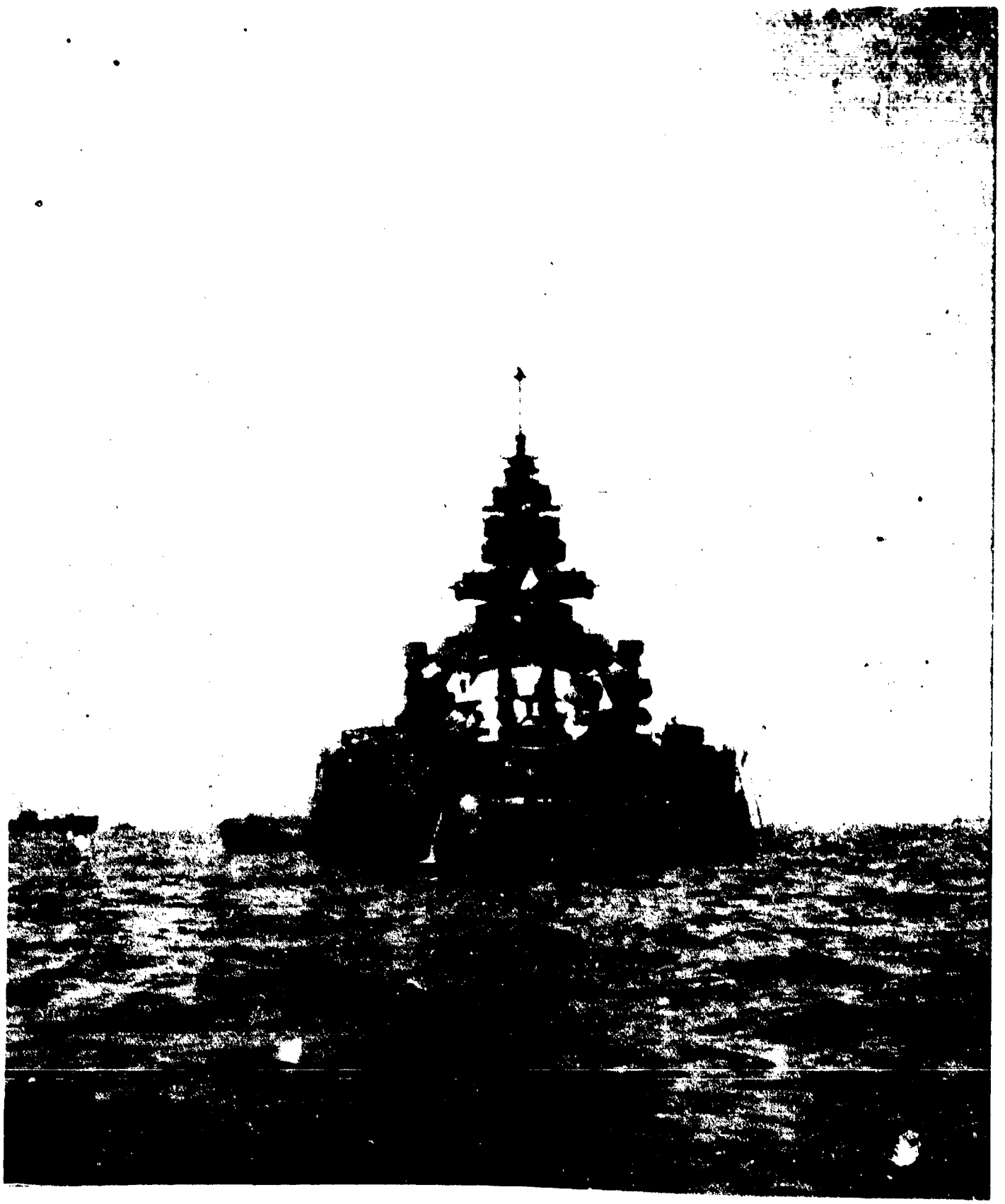
AB-CR-227-289-67. View from off starboard beam after Test B.



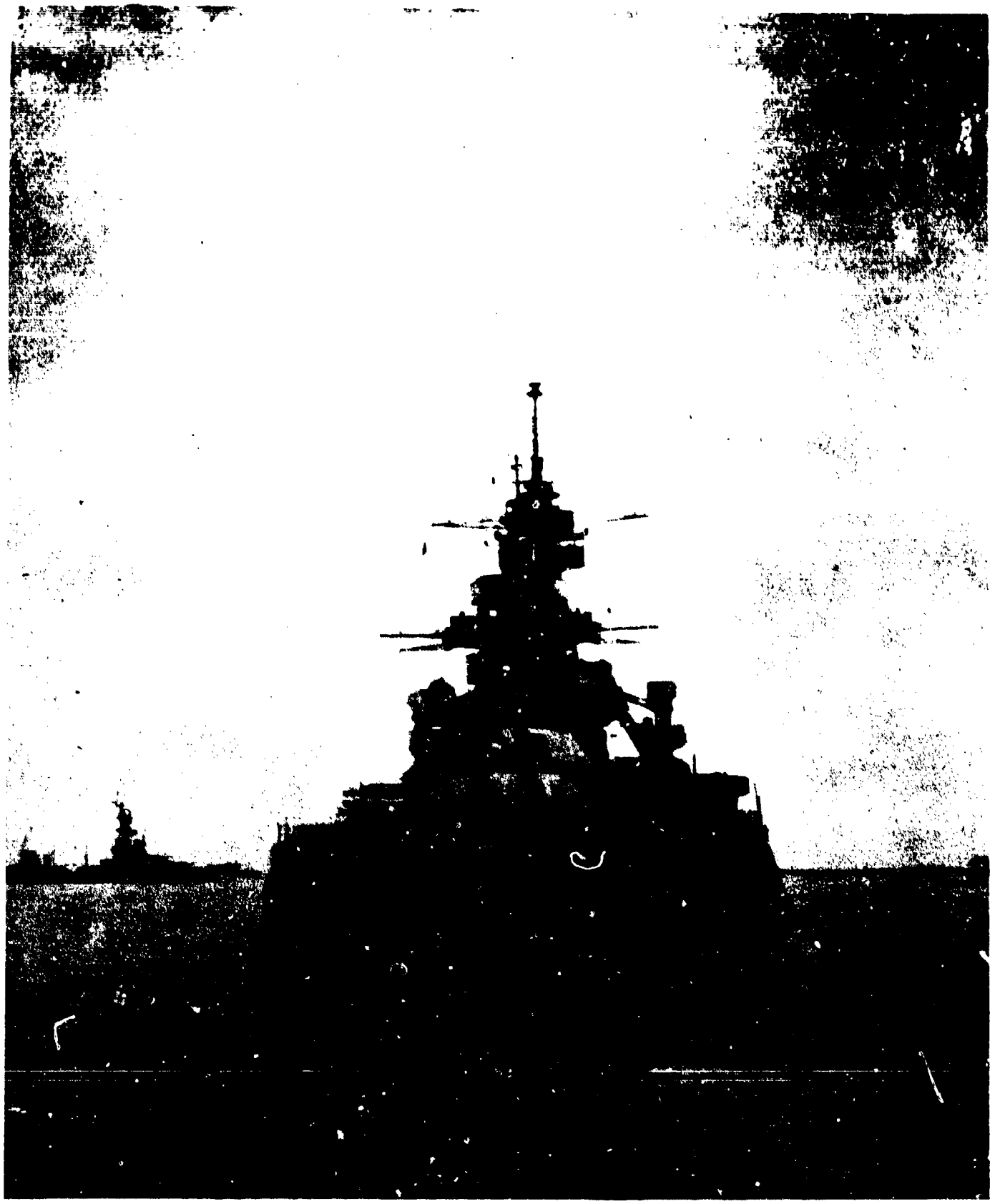
BB-CR-227-501-120. View from off starboard quarter before Test B.



AB-CR-227-289-66. View from off starboard quarter after Test A.



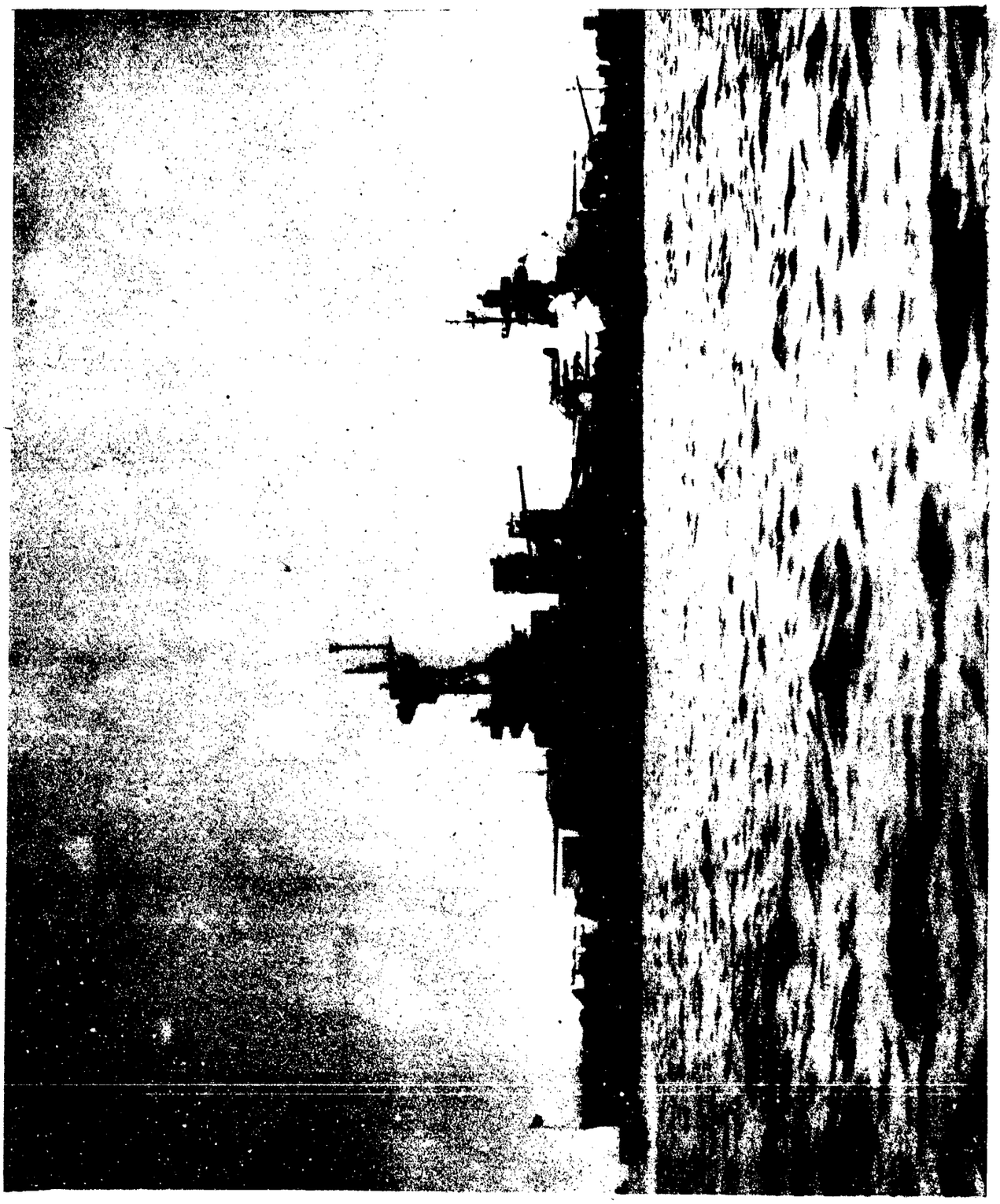
BB-CR-227-501-119. View from dead astern before Test B.



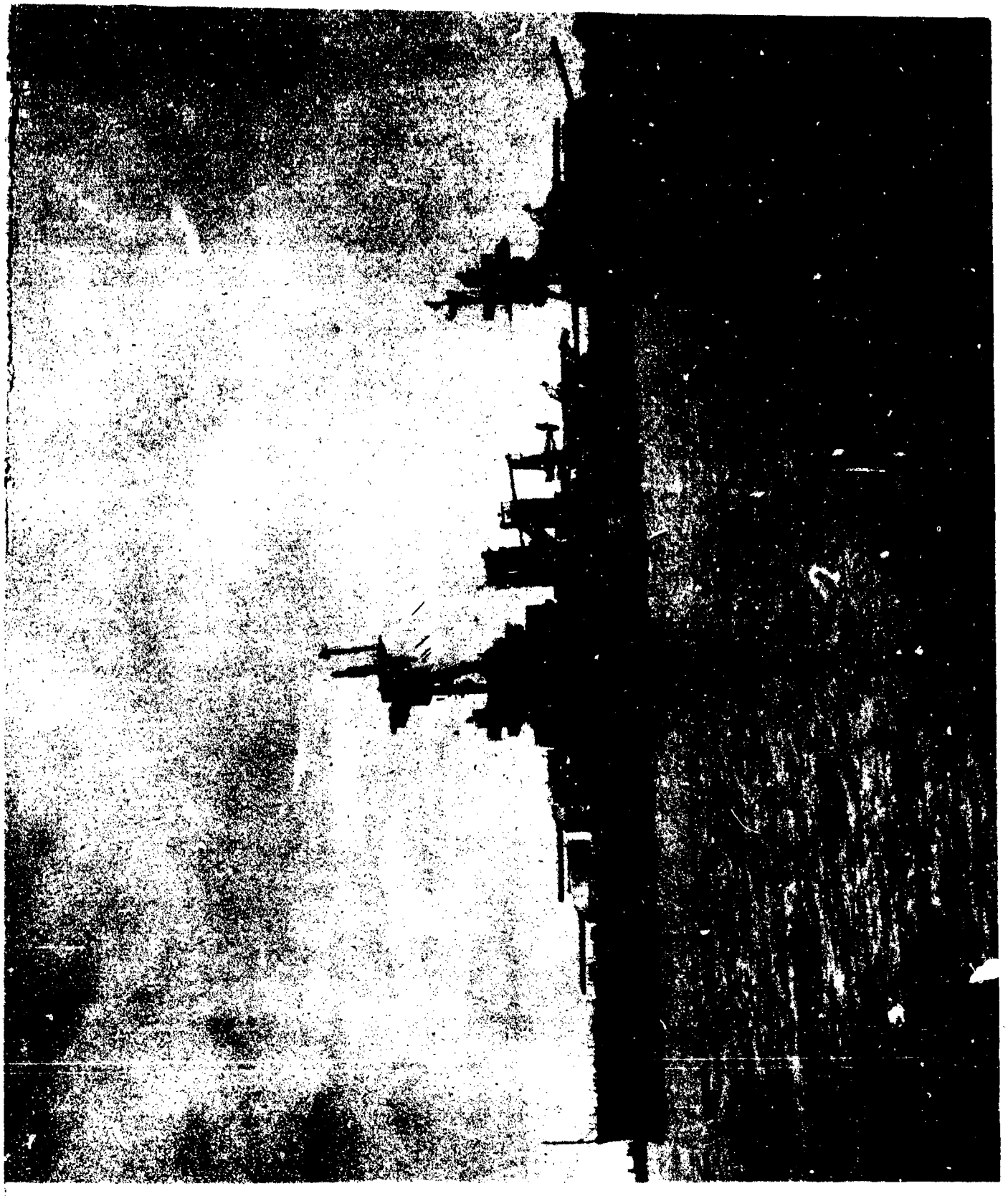
AB-CR-227-289-65. View from dead astern after Test B.

BB-CR-227-501-118. View from off port quarter before Test B.

AB-CR-227-289-72. View from off port quarter after Test B.



BB-CR-227-501-117. View from off port beam before Test B.



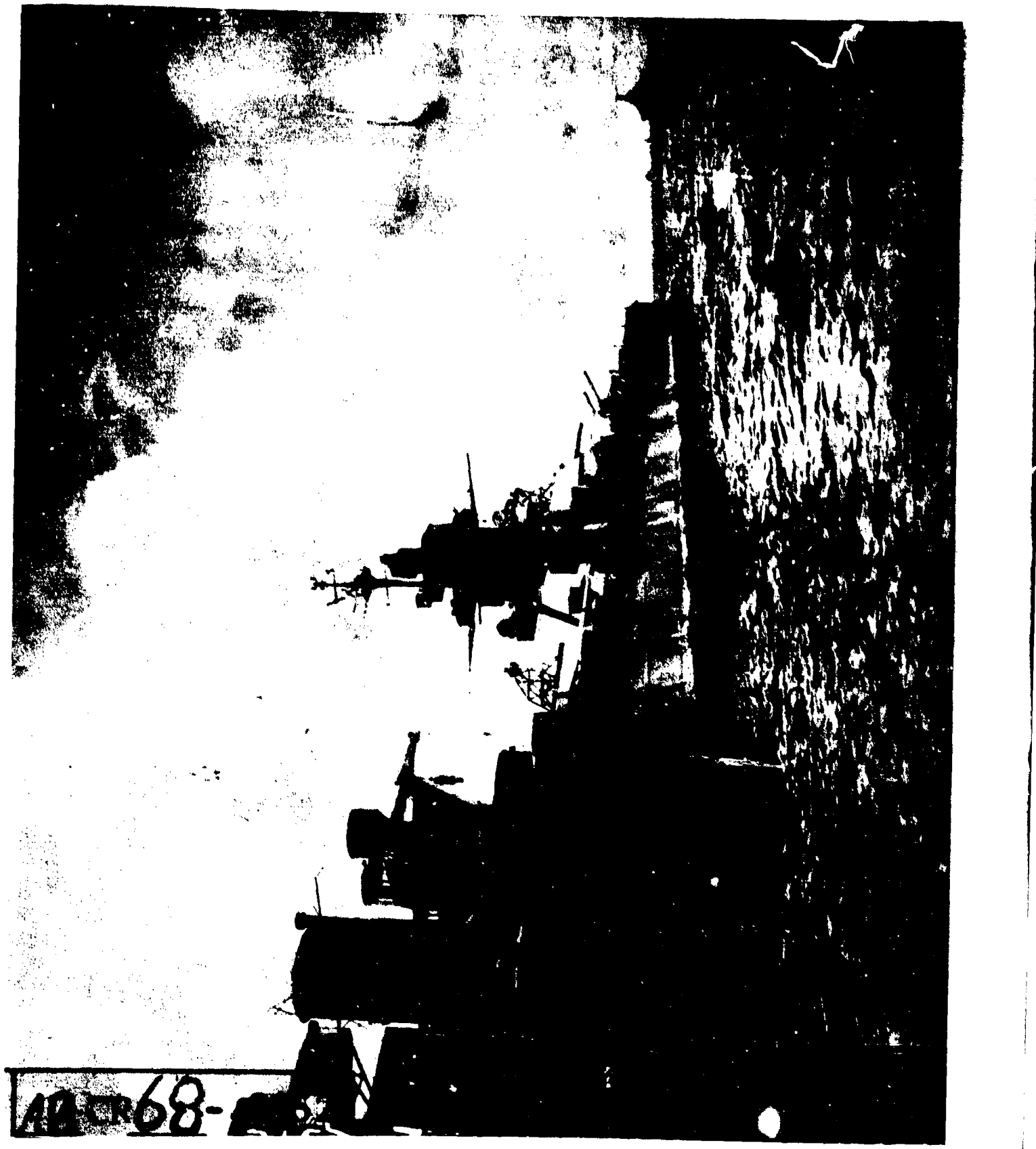
AB-CR-227-289-71. View from off port beam after Test B.

BB-CR-227-501-116. View from off port bow before Test B.

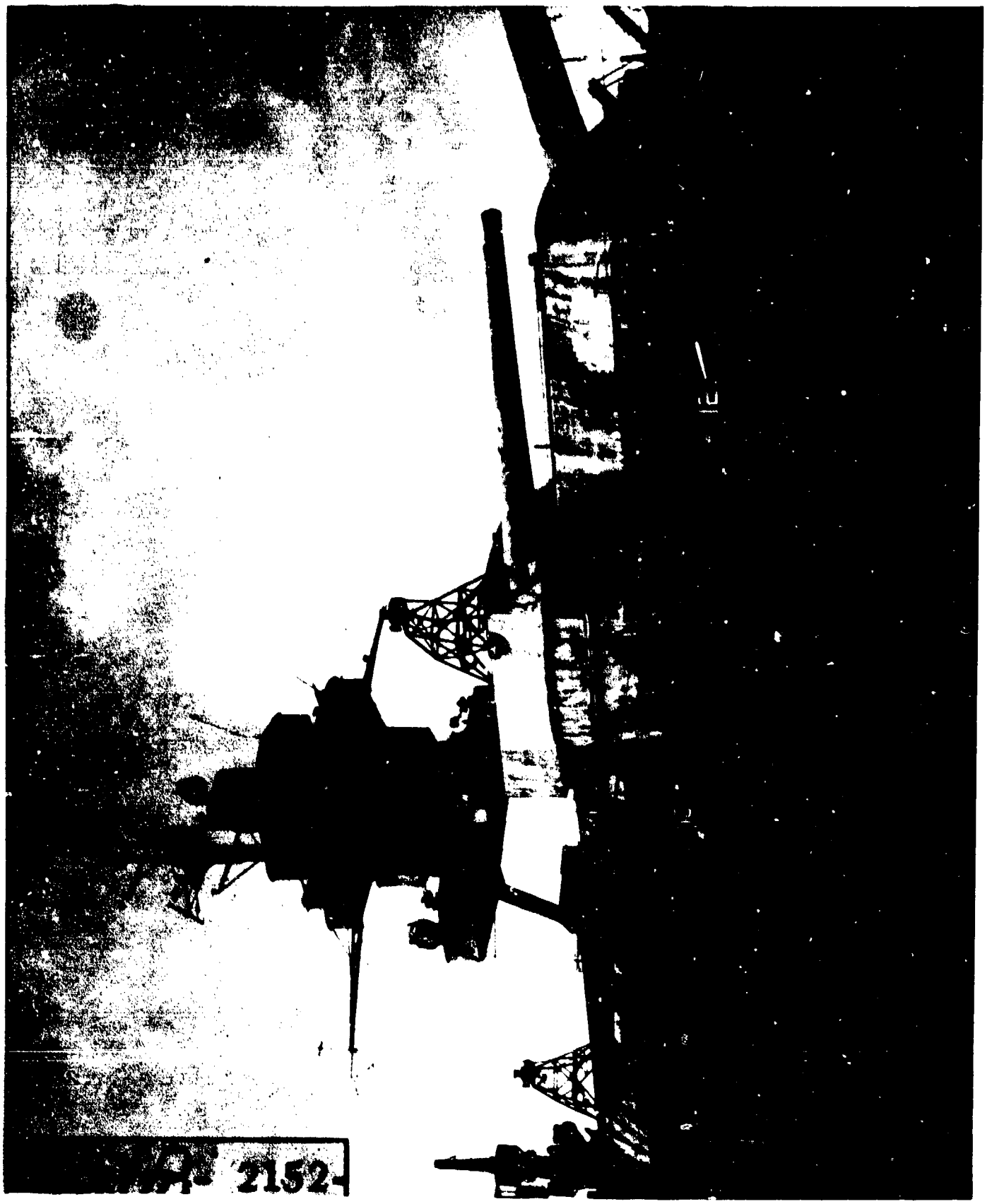
AB-CR-227-289-70. View from off port bow after Test B.

AB-CR-68-2152-2. View of port shell plating and superstructure from port bow.

AB-CR-68-2152-5. View of port shell plating and forward superstructure.



AB-CR-68-2152-3. Port shell plating and after superstructure, looking aft on port side.



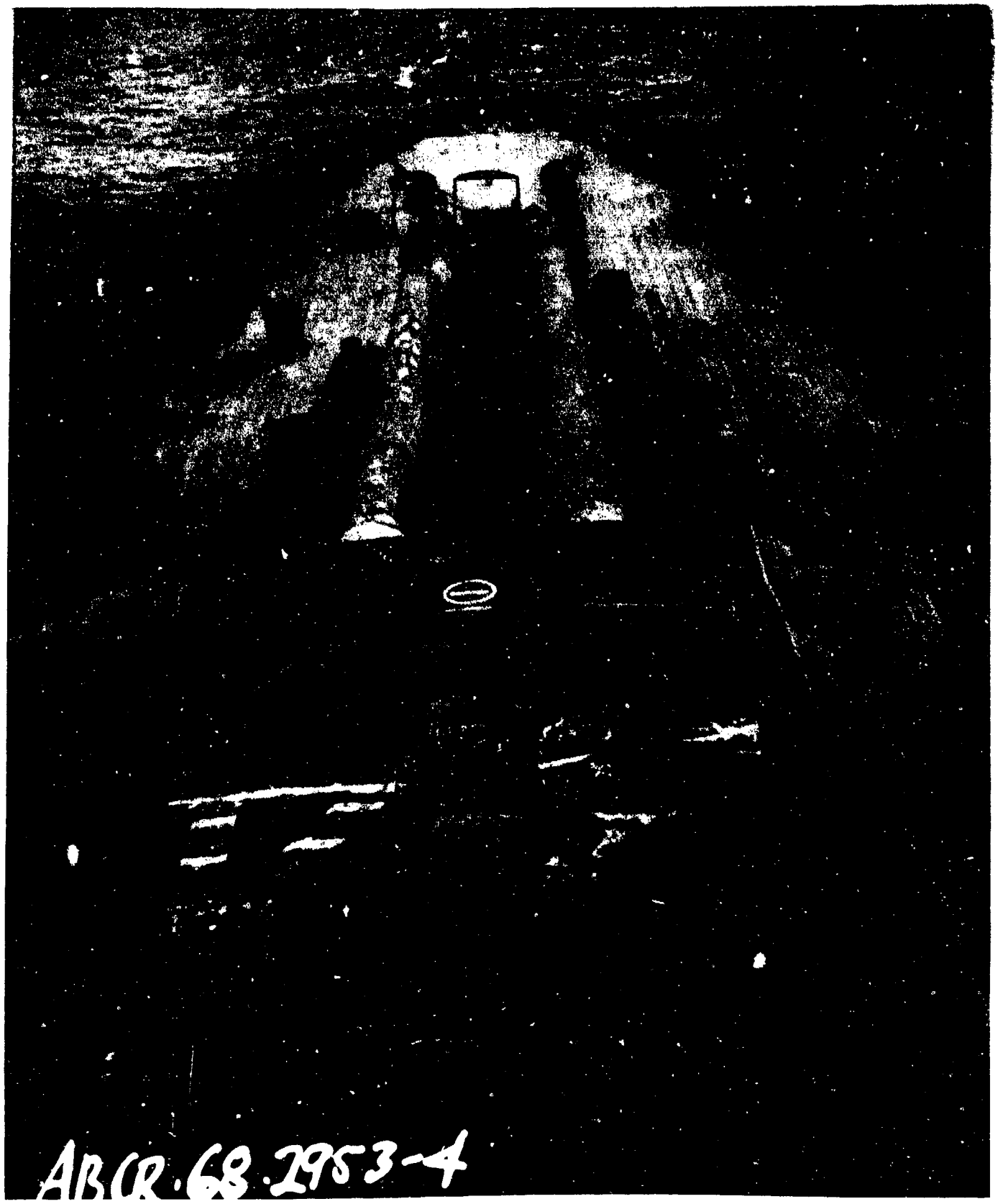
AB-CR-68-2152-6. Port shell plating and after superstructure.

AP-CR-68-2150-9. Starboard shell plating and after superstructure.

AB-CR-68-2150-11. Starboard shell plating, frames 65 and 115 and superstructure.

AB-CR-68-2150-10. Starboard shell plating and superstructure, looking forward.

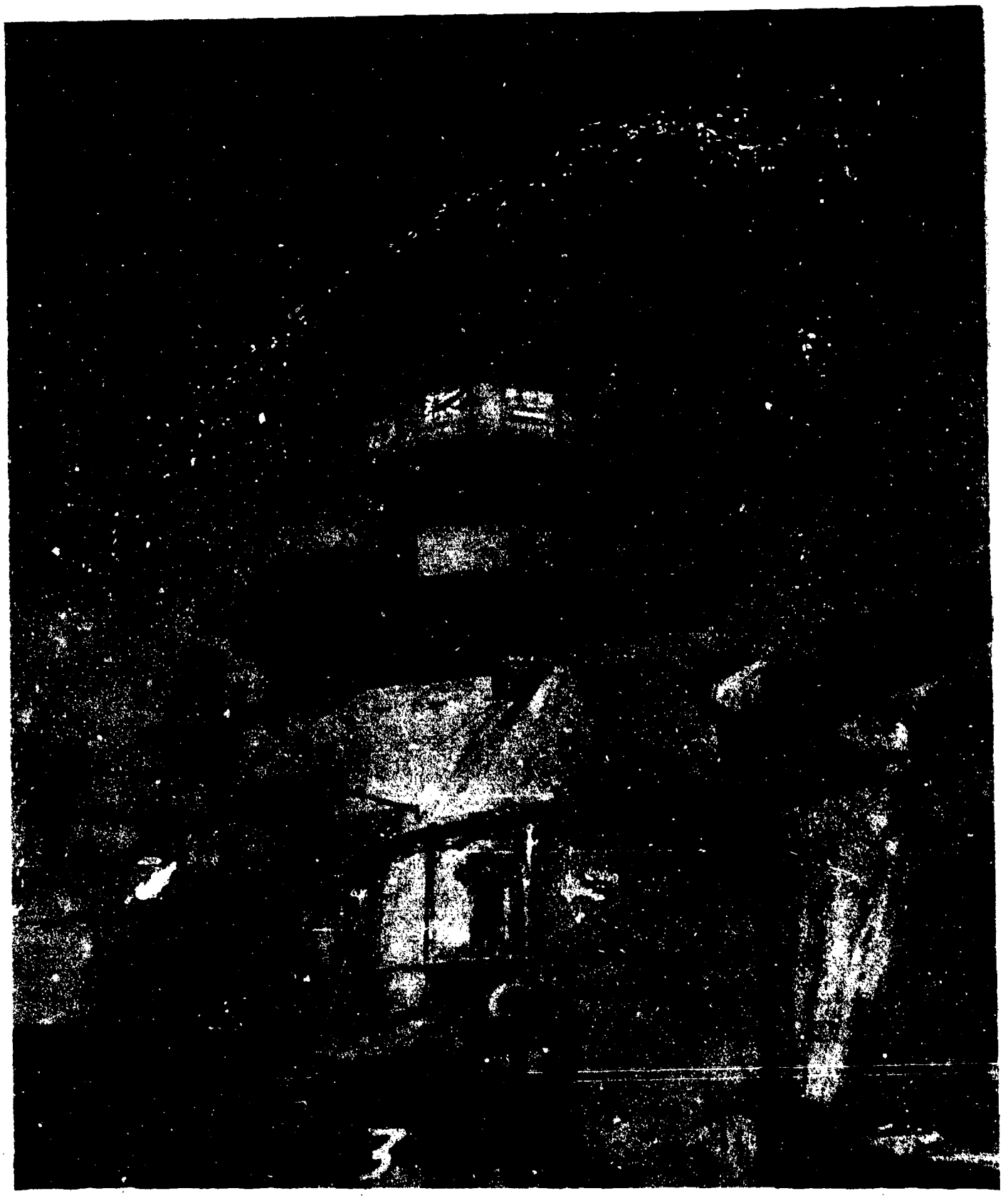
AB-CR-68-2152-1. Starboard shell plating and forward superstructure.



AB-CR-68-2953-4. Weather deck, looking forward from superstructure.

AB CR 68-2953-1

AB-CR-68-2953-2. Weather deck and forward superstructure from bow of vessel.



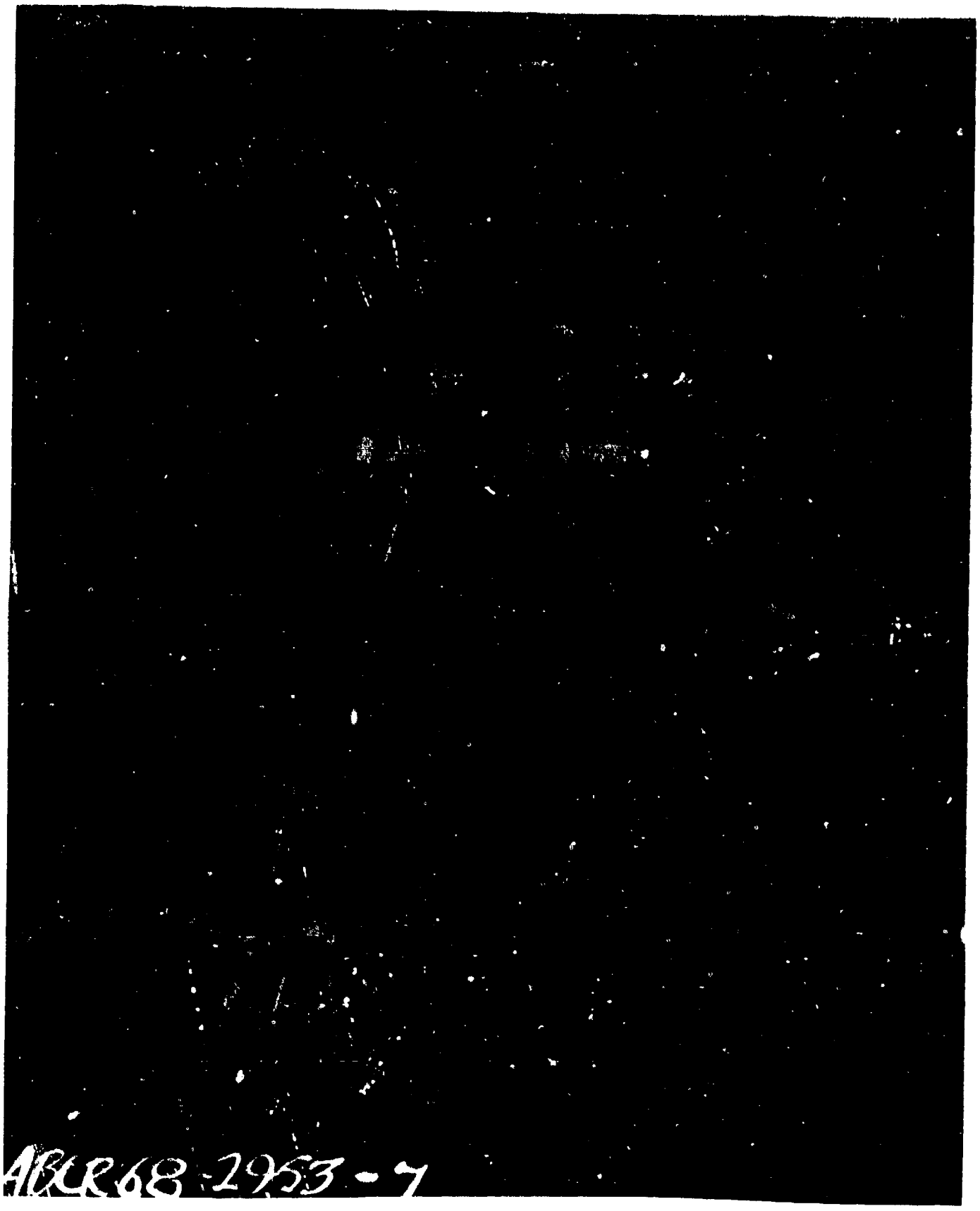
AB-CR-68-2953-3. Foremast structure, looking aft from frame 25, starboard side.

AB-CR-68-2953-1. Foremast structure, looking aft from frame 25, port side.

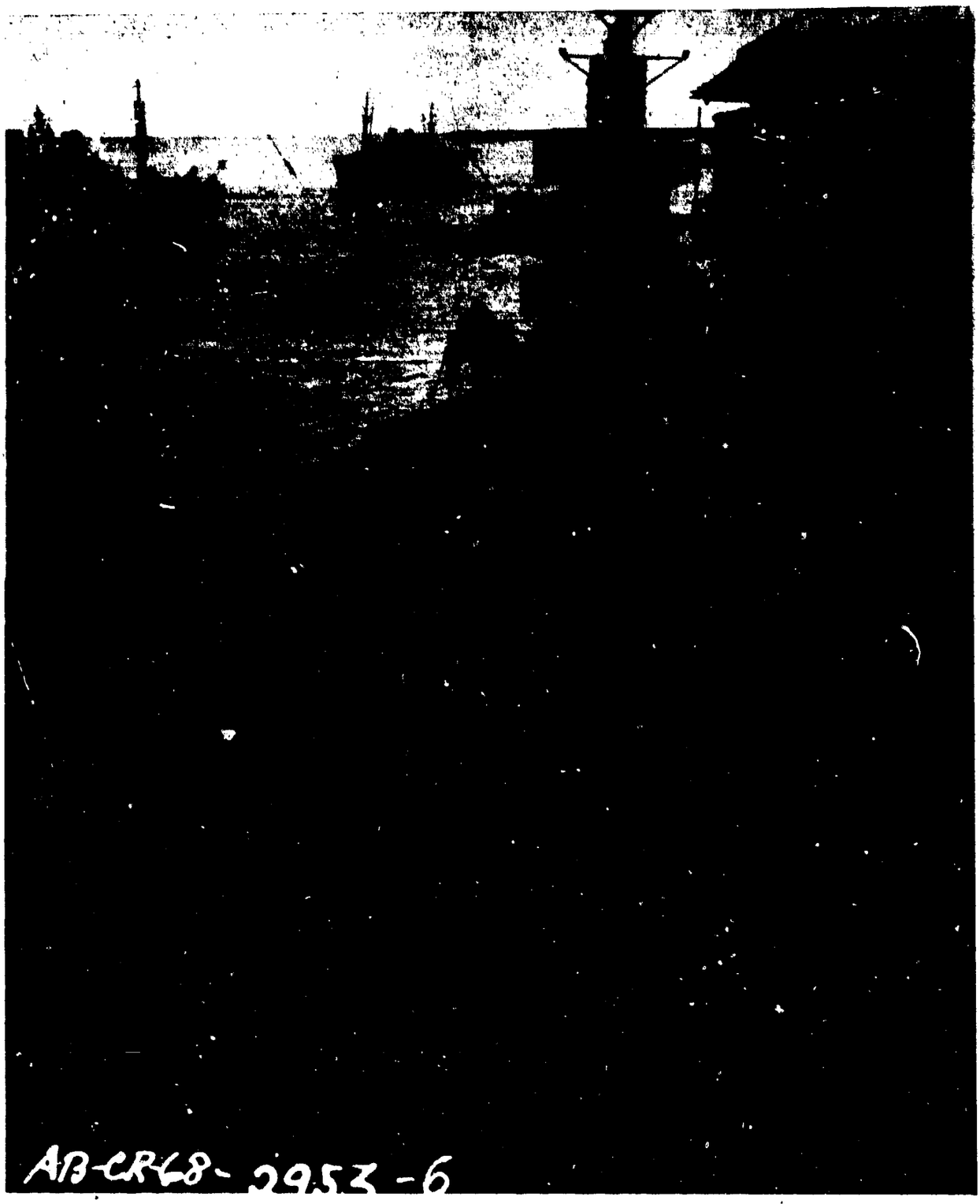
AB-CR-68-2152-4. Foremast structure, stack, and main battery control tower from port.

AB-CR-68-2952-5. Looking forward on starboard side of main deck from frame 90.

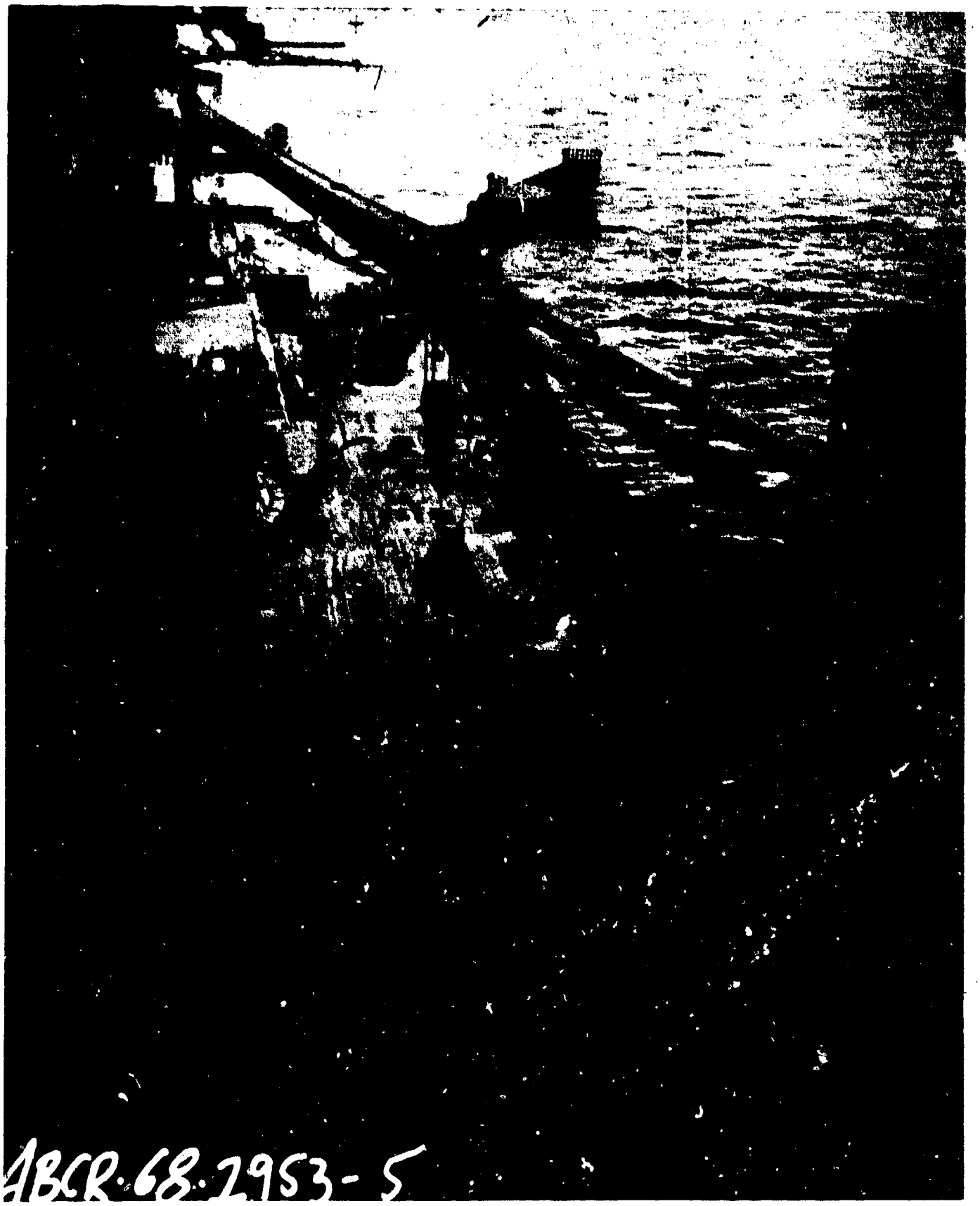
AB-CR-87-2544-8. Looking forward on port side of main deck from frame 85.



AB-CR-68-2953-7. Looking aft from foremast structure.



AB-CR-68-2953-6. Looking aft along starboard side from foremast structure.



AB-CR-68-2953-5. Looking aft along port side from foremast structure.

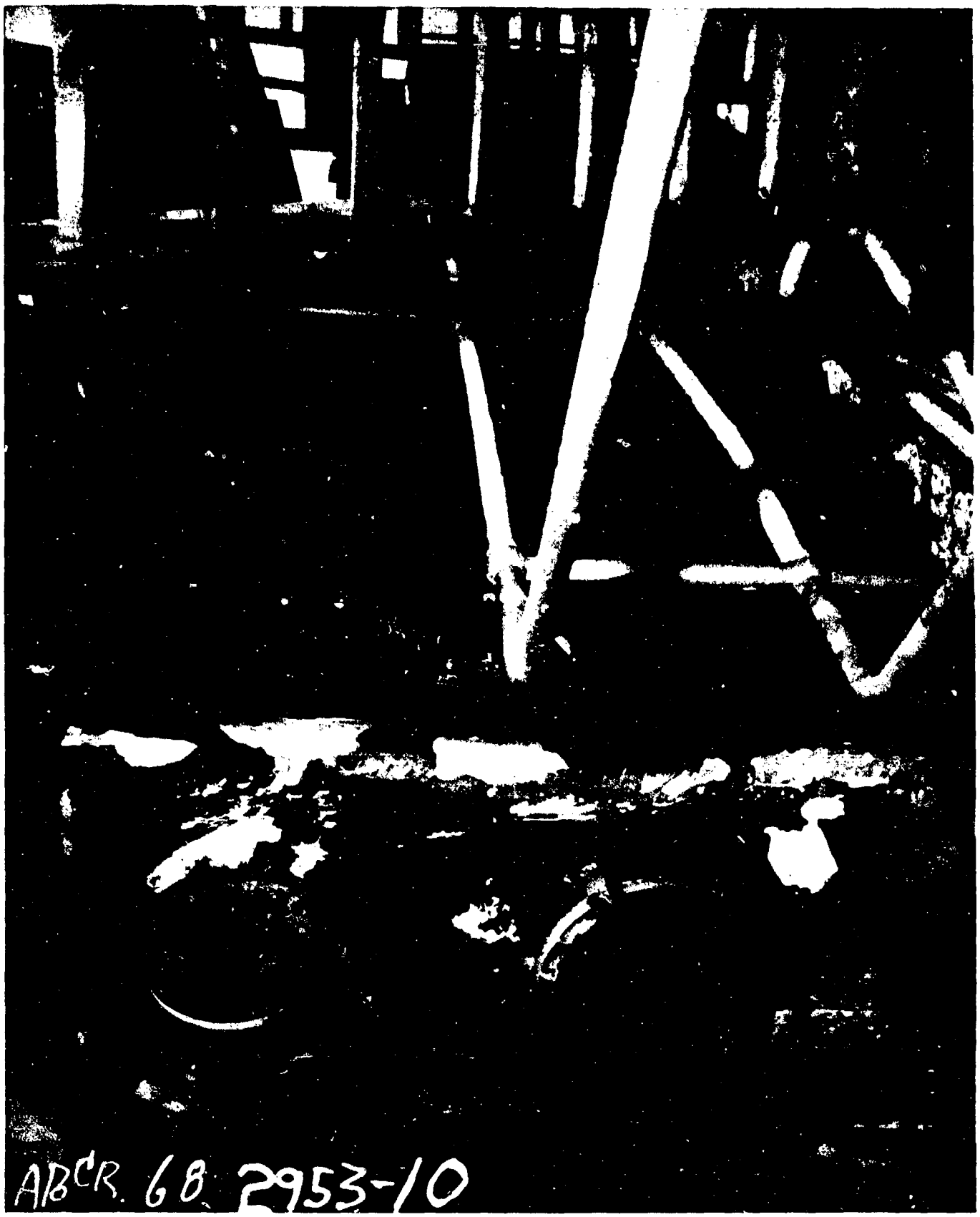
AB-CR-68-2952-6. Mainmast structure, looking aft and to port.

AB-CR-68-2952-12. Mainmast structure looking aft and to starboard.

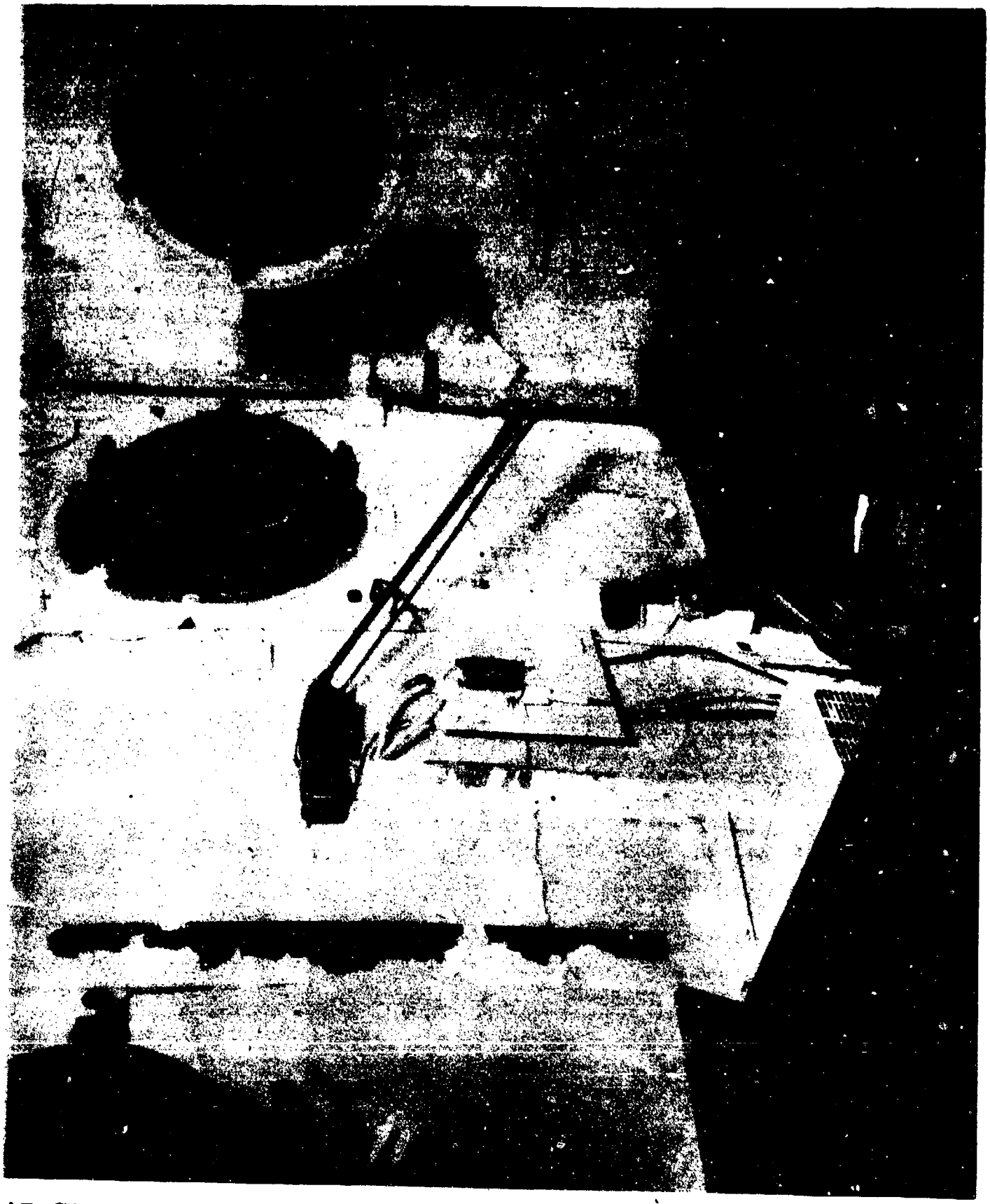
AB-CR-68-2952-7. Mainmast structure, looking forward and to port.

AB-CR-68-2952-9. Mainmast structure, looking forward and to starboard.

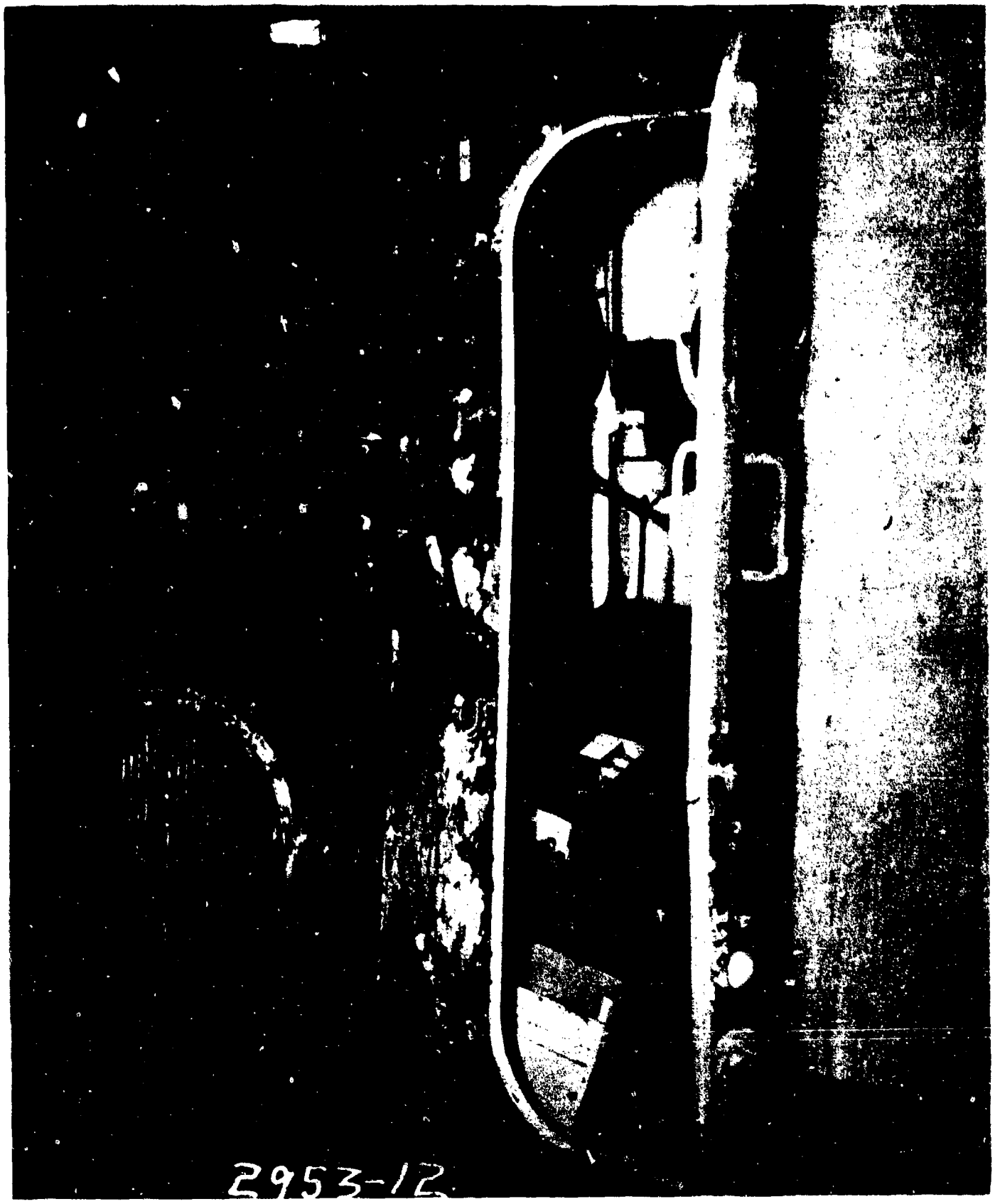
AB-CR-68-2952-8. Looking forward on main deck centerline from frame 140.



AB-CR-68-2953-10. After bulkhead of captain's sea cabin, navigating bridge, frame 55. Principal damage occurred during Test A.

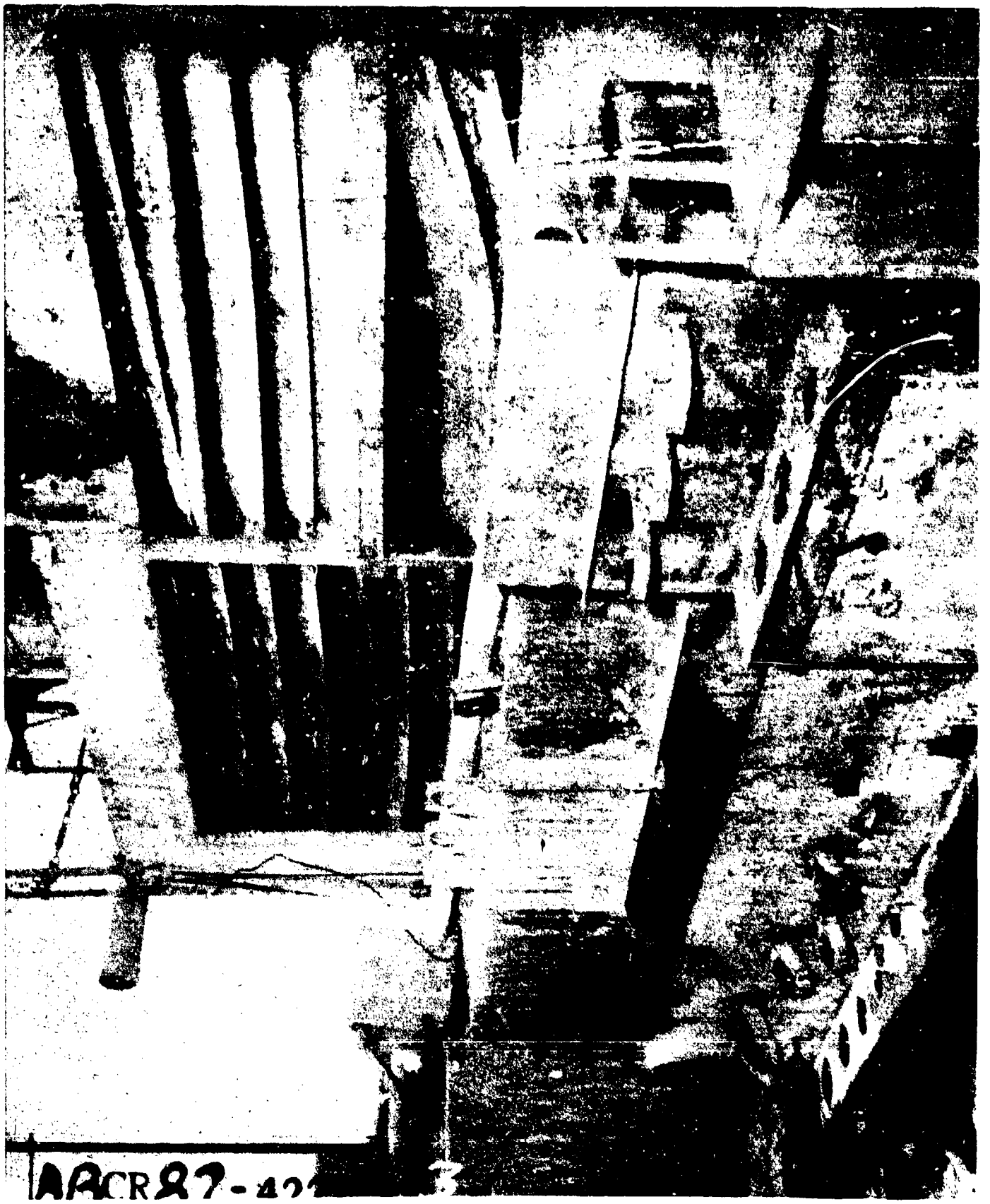


AB-CR-68-2953-11. Interior of captain's sea cabin, navigating bridge level, looking aft and to port.

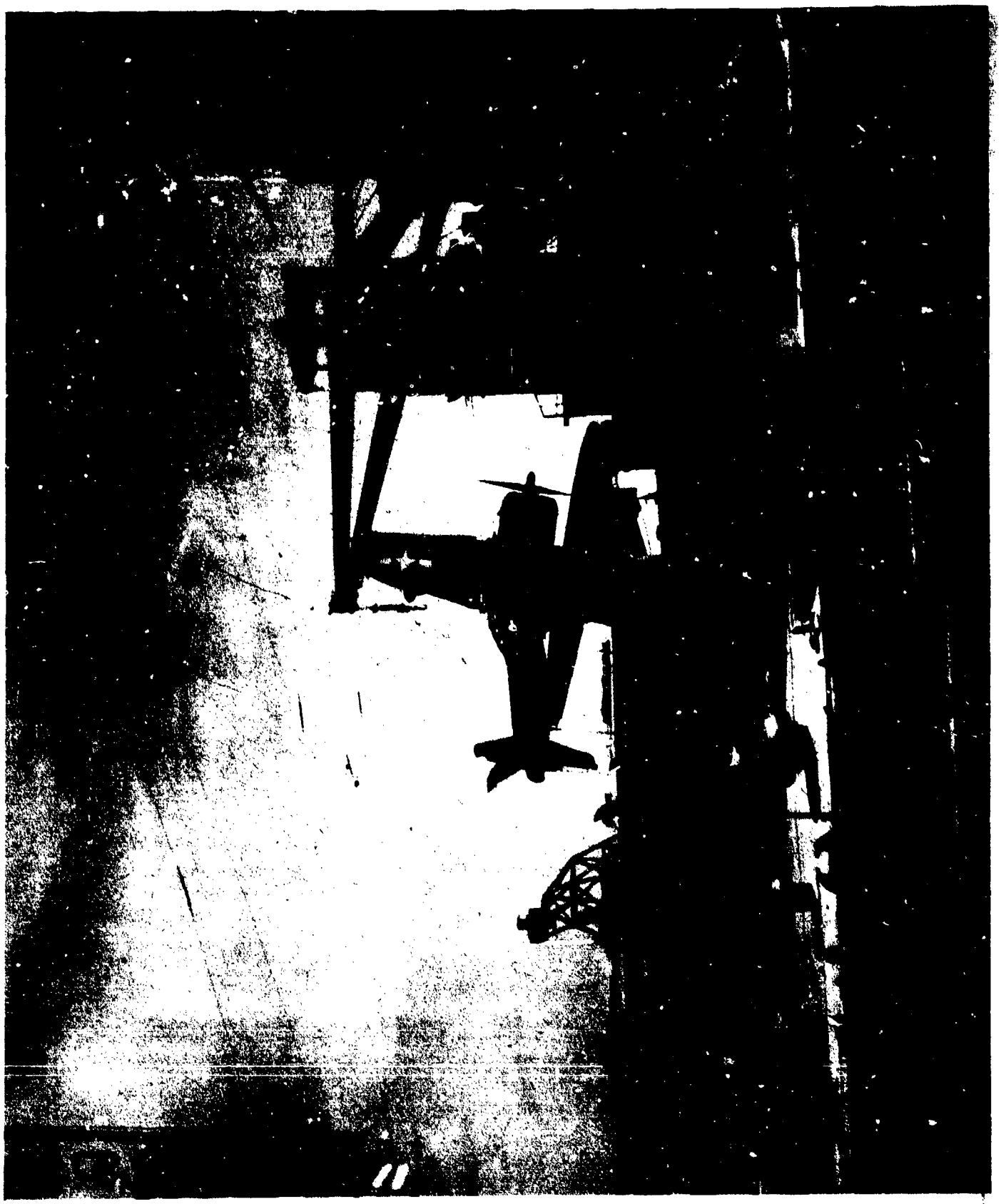


AB-CR-68-2953-12. Dished door to captain's sea cabin, navigating bridge, starboard side.

AB-CR-82-4222-2. Starboard bulkhead of uptake enclosure. Principal damage was caused by Test A.

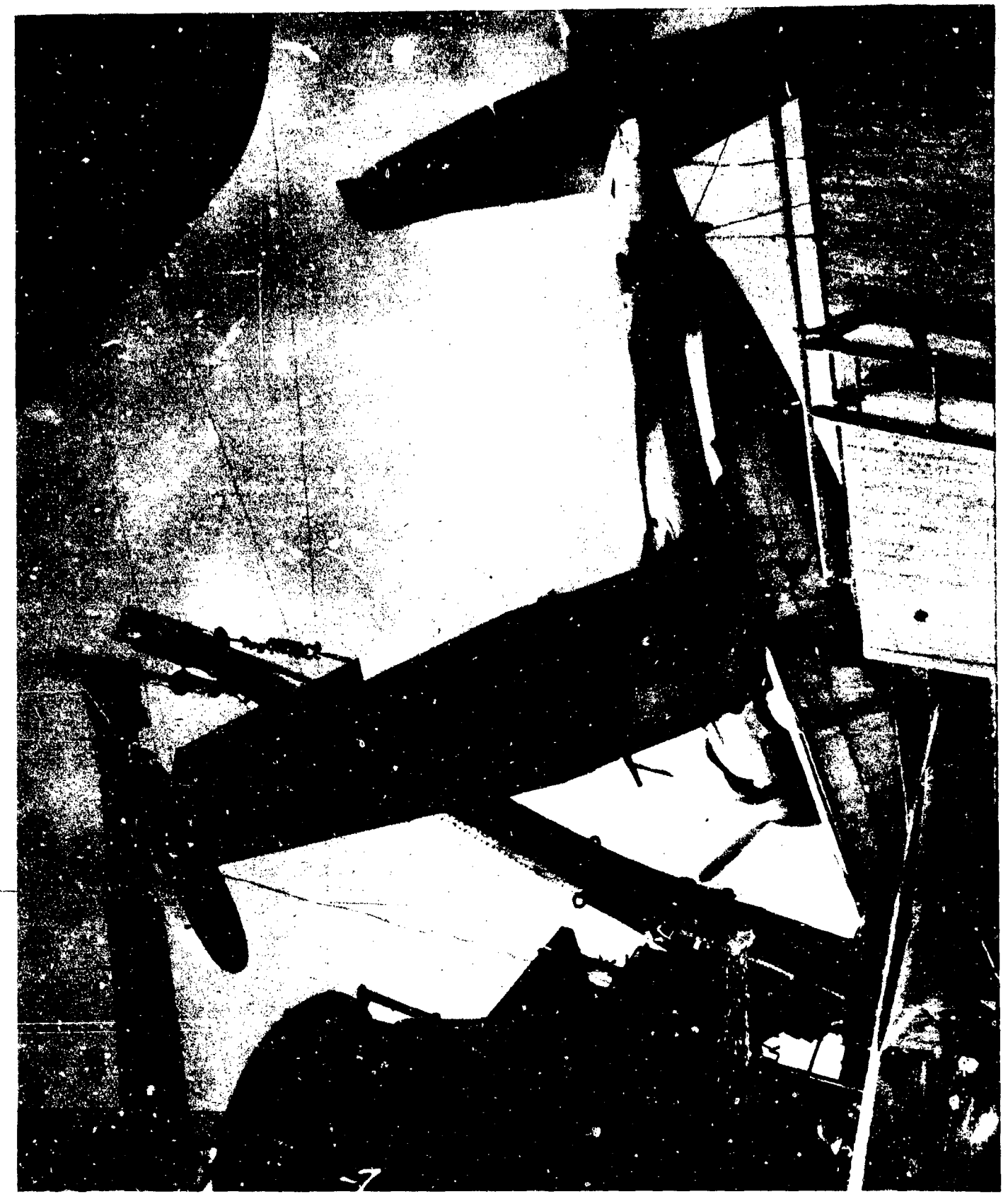


AB-CR-82-4222-3. Damaged air intake louvres on the after bulkhead of main battery control tower at the superstructure deck level, frame 74.

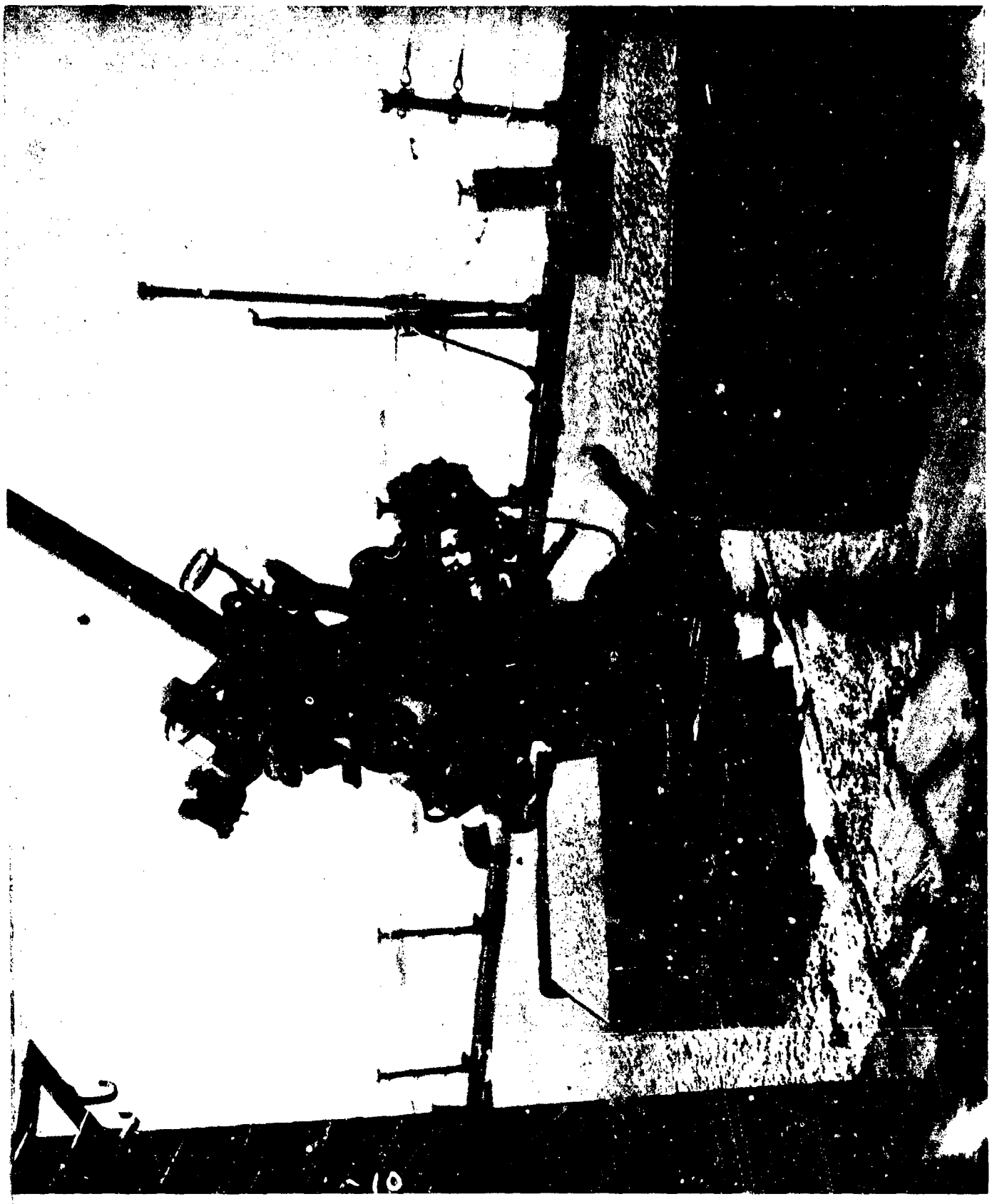


AB-CR-80-2092-11. Main battery control tower and catapult from starboard side.

AB-CR-87-2544-11. Damaged plane and main battery control tower from starboard side.

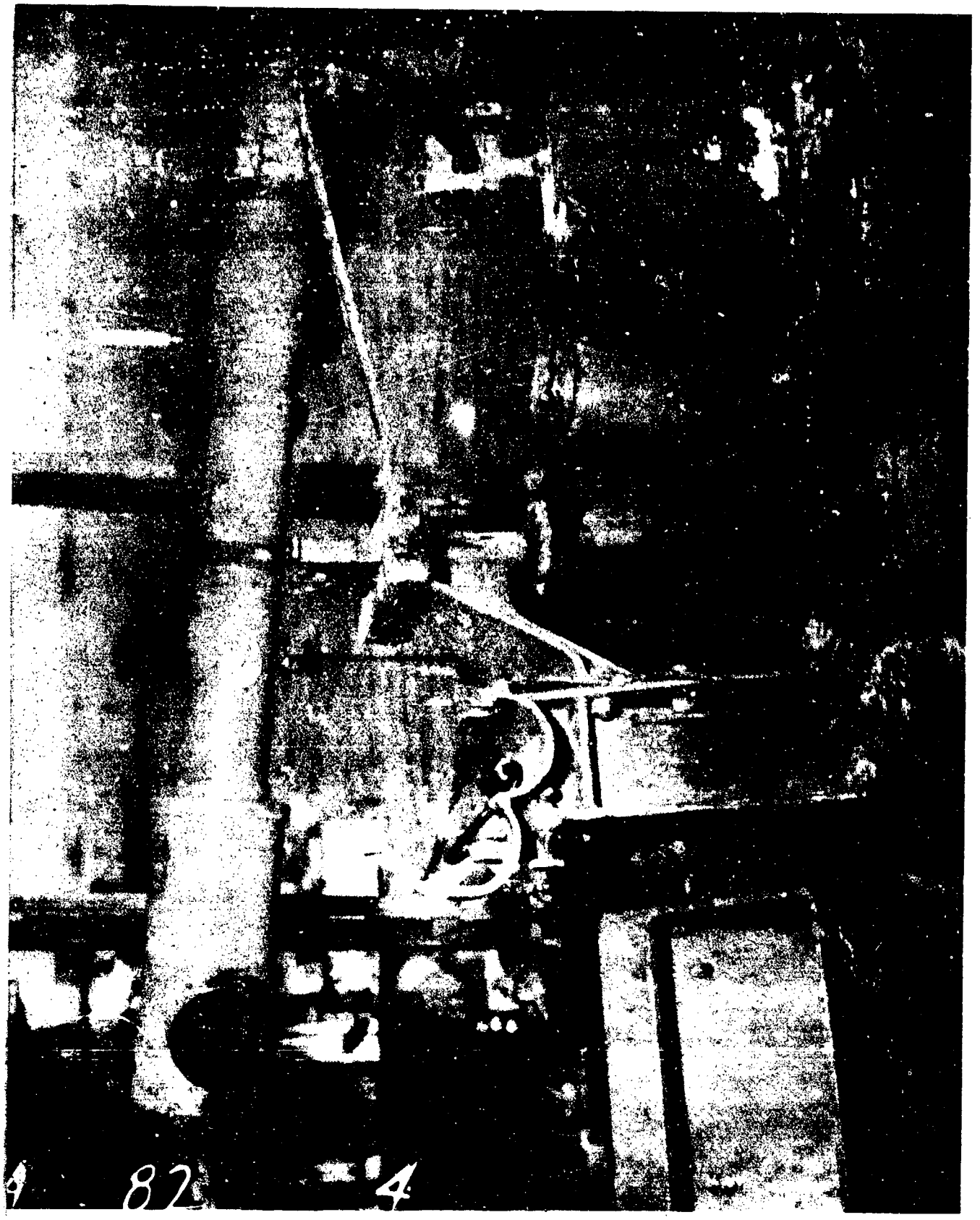


AB-CR-87-2544-7. Damaged plane and main battery control tower from port side.

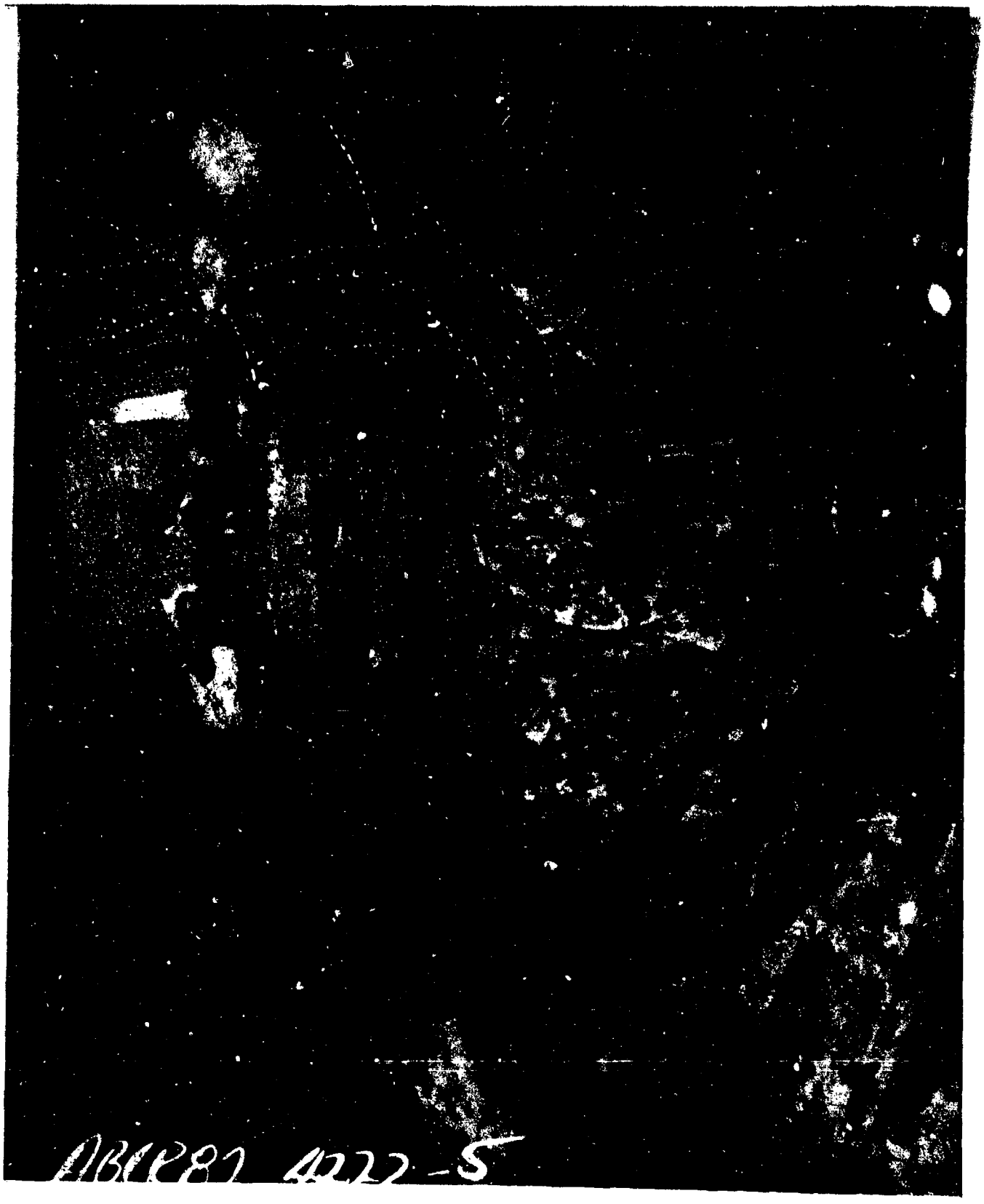


AB-CR-87-2544-10. Dislodged ready service boxes, main deck, starboard side about frame 100.

AB-CR-87-2544-4. Foremast structure, looking up and aft, showing damaged radar array.



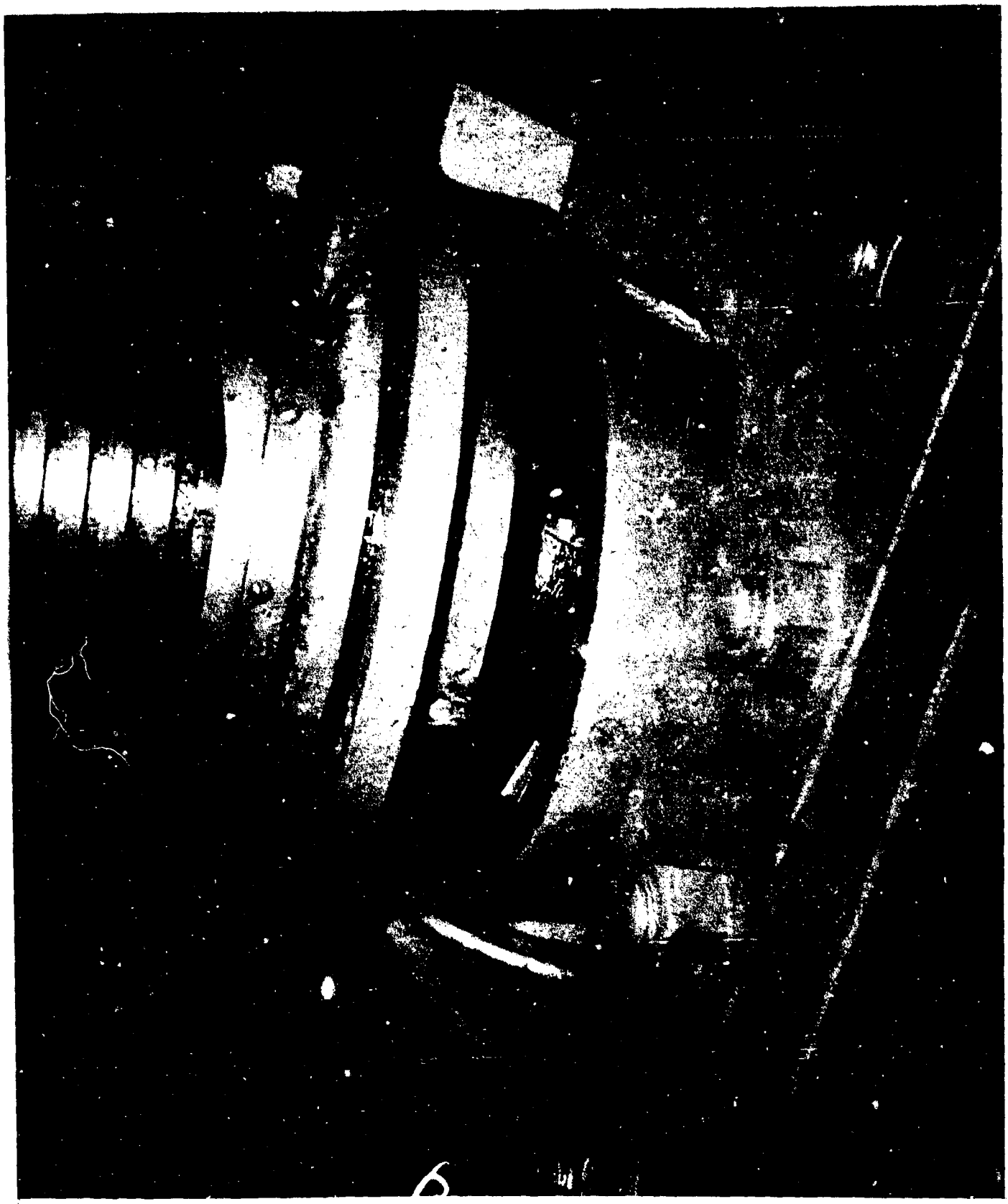
AB-CR-82-4222-4. Damaged directorscope on port side of secondary battery control station, frame 72.



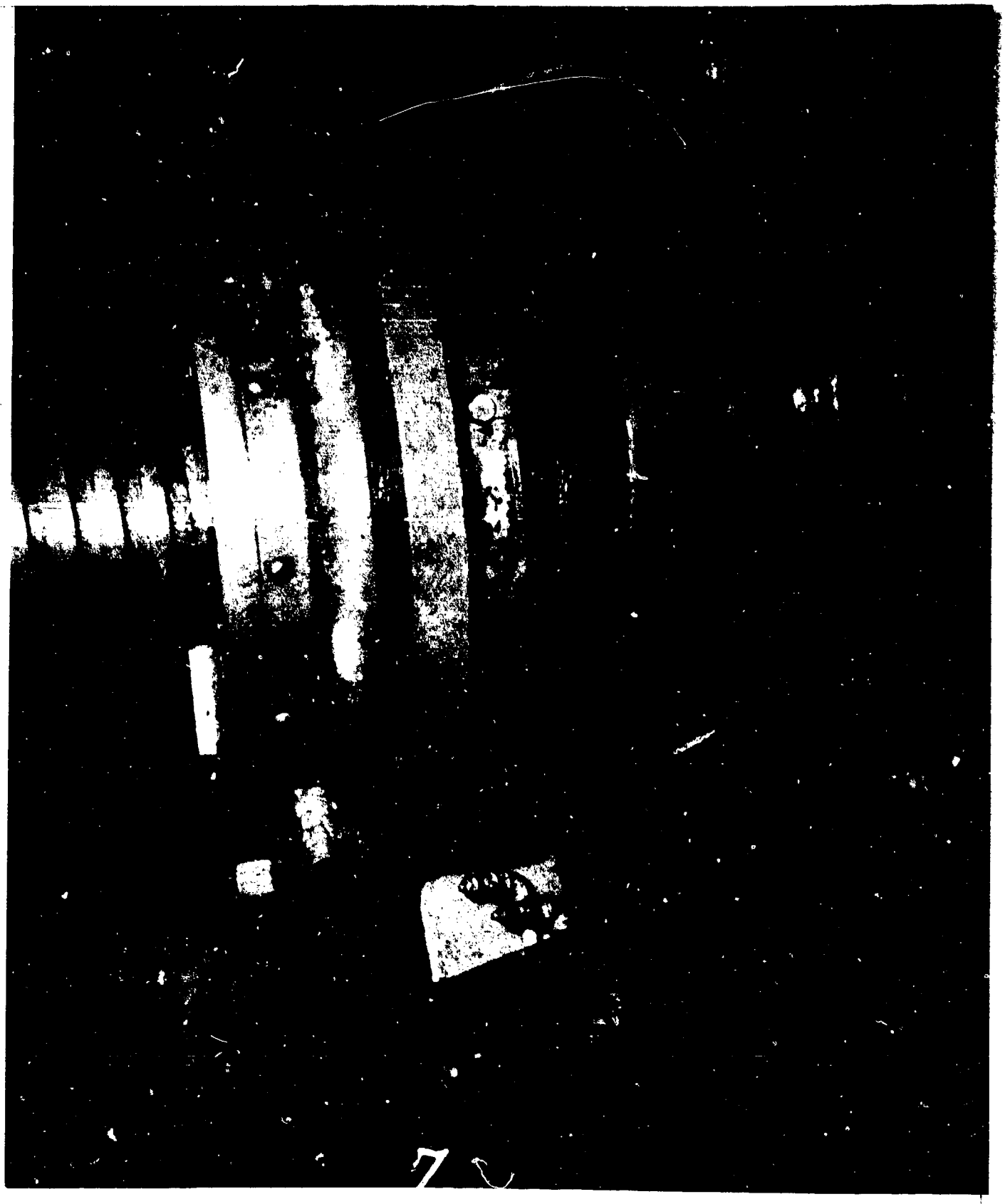
AB-CR-82-4222-5. Broken pedestal of director-scope, port side of secondary battery control station. See photo No. 4222-4.

AB-CR-68-2981-1. Right gun of Turret 3, elevating screw oscillating bearing, looking down and to front showing top assembly pulled out of position and ball bearings scattered.

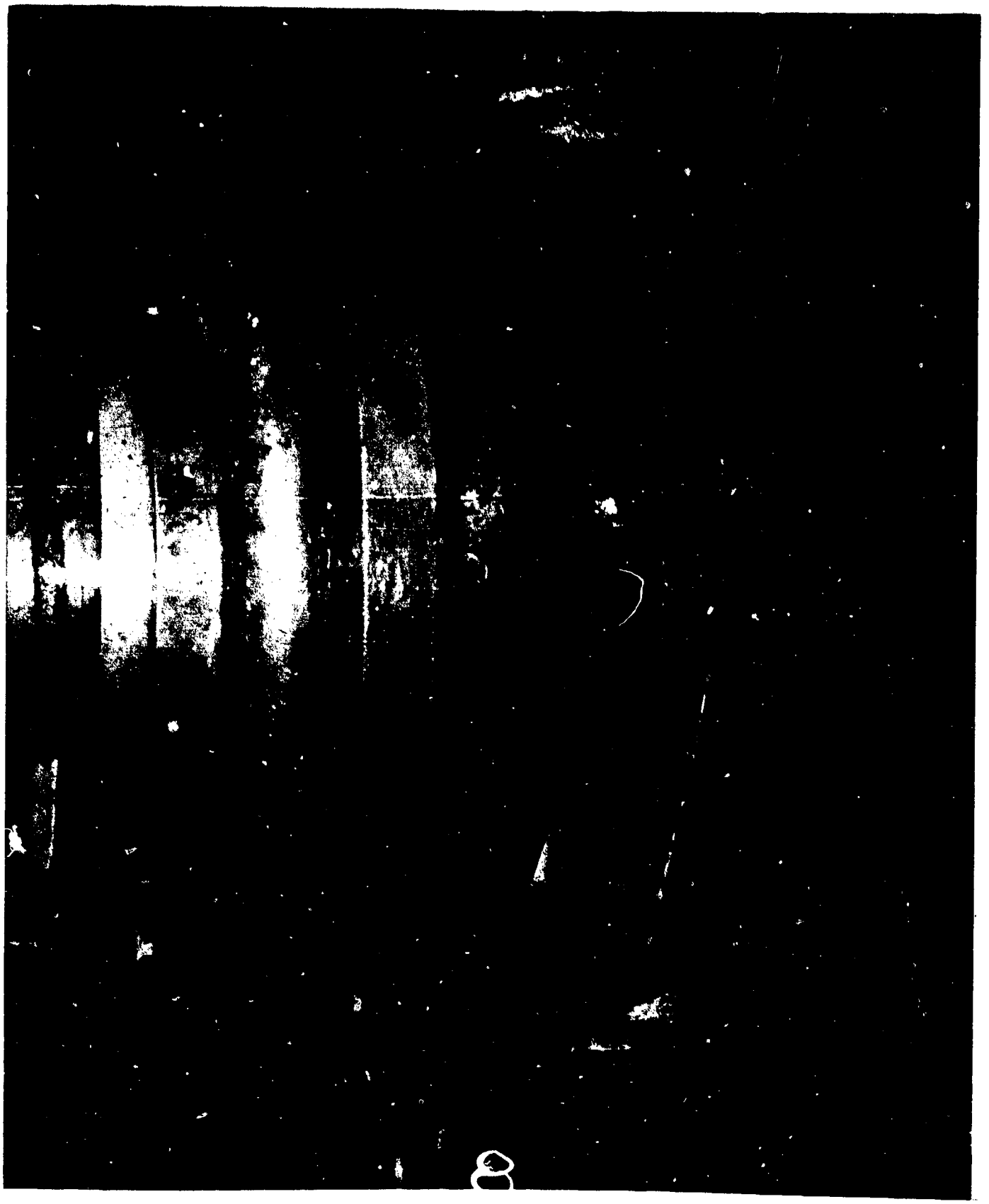
AB-CR-68-2981-2. Right gun of Turret 3, elevating screw oscillating bearing, looking down and to rear showing top assembly pulled out of position.



AB-CR-82-4222-6. Left gun of Turret 2, elevating screws oscillating bearing, view looking down and to rear showing top assembly pulled out of position.



AB-CR-82-4222-7. Left gun of Turret 2, elevating screw oscillating bearing, showing top assembly pulled out of position.



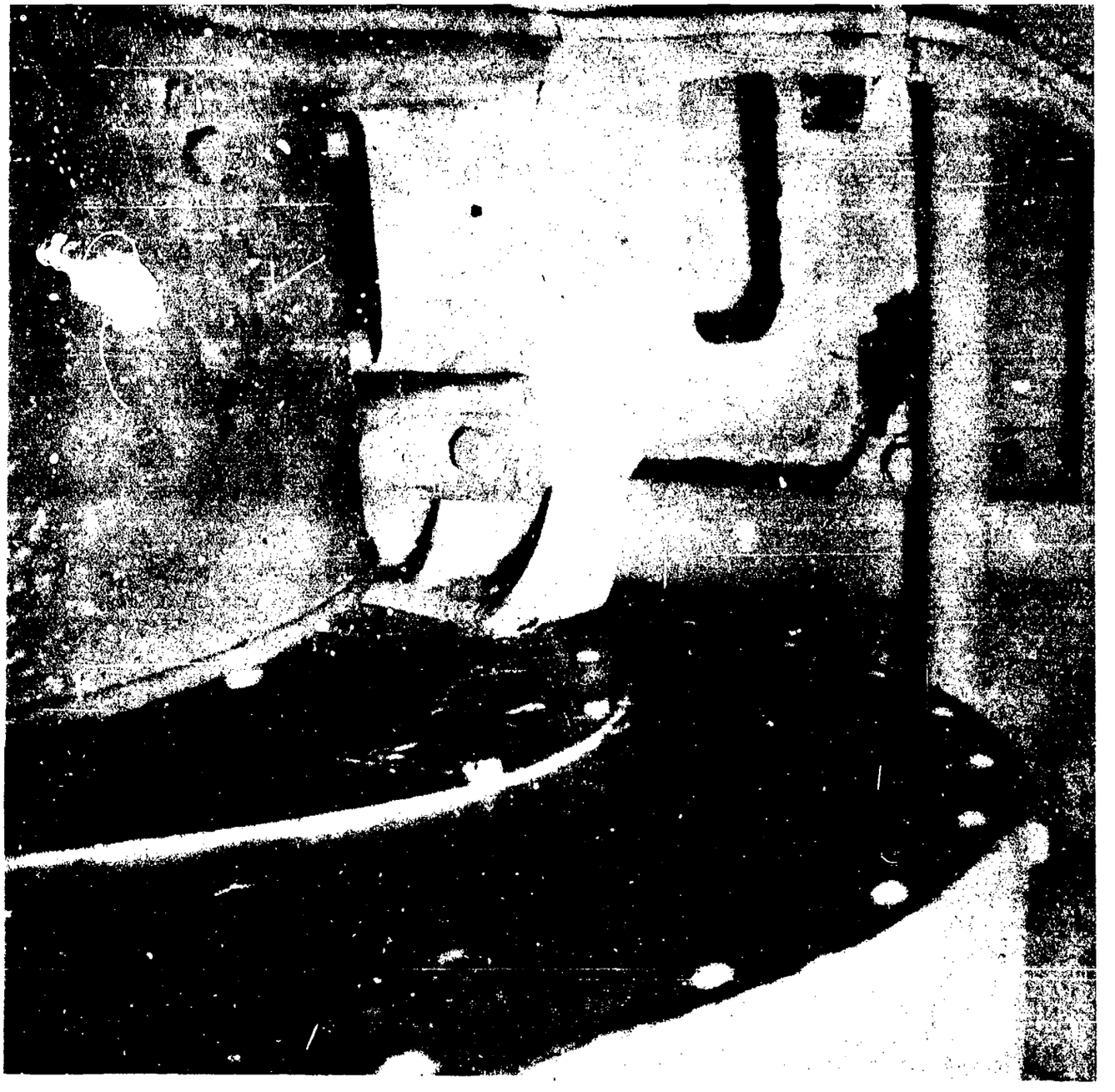
AB-CR-82-4222-8. Left gun of Turret 2, elevating screw oscillating bearing, showing top assembly pulled out of position.

AB-CR-82-4222-9. Right gun of Turret 3, elevating screw oscillating bearing, view of underside.

AB-CR-82-4222-10. Right gun of Turret 3, elevating screw oscillating bearing, closeup of underside.

AB-CR-62-4164-5. Turret 5 - Annular space between barbette and stool, showing fracture in near holding down clip.

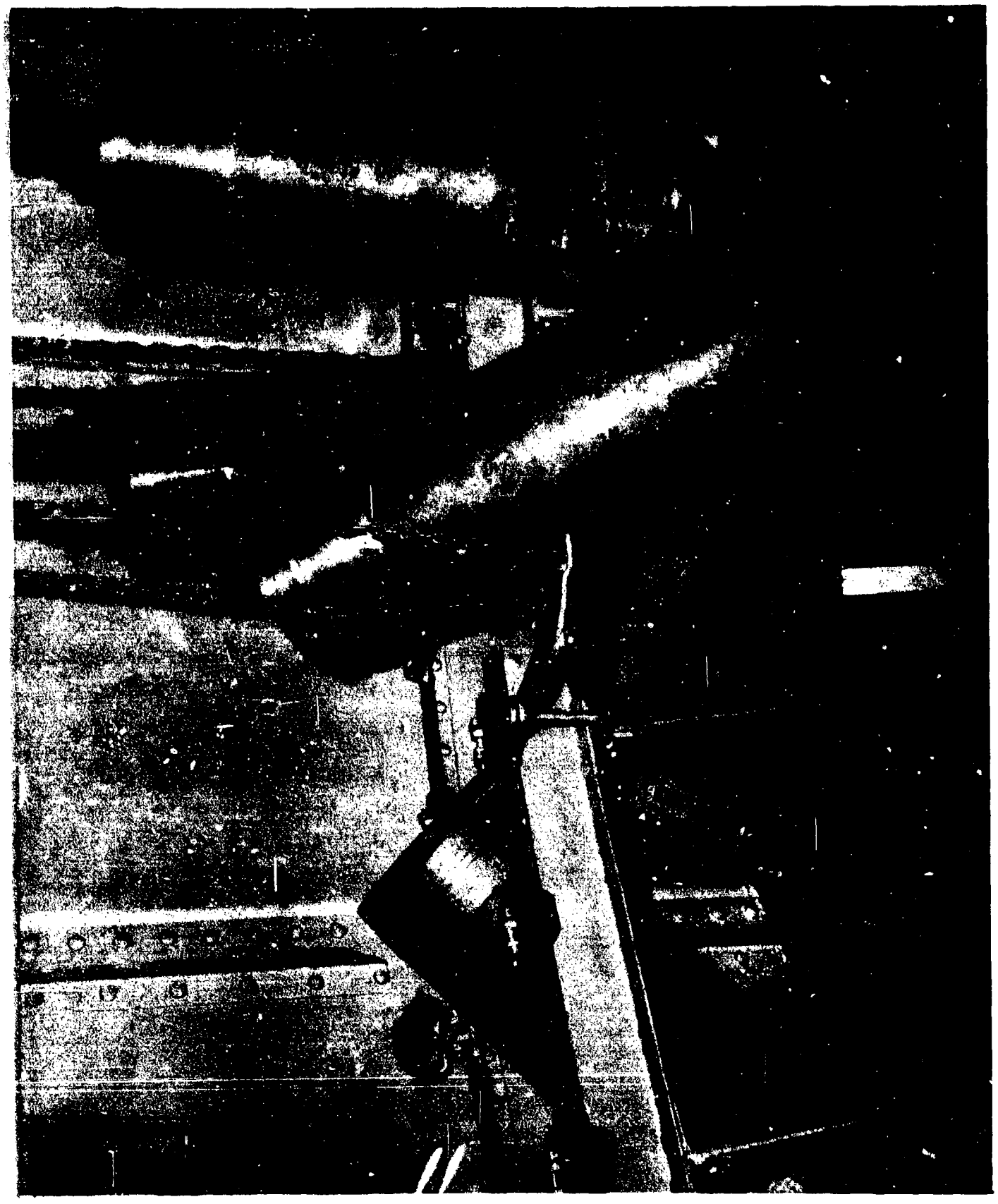
AB-CR-62-4164-2. Damage to column under barbette and stool of turret 5, frame 118, in 14" magazine, D-36-MS.



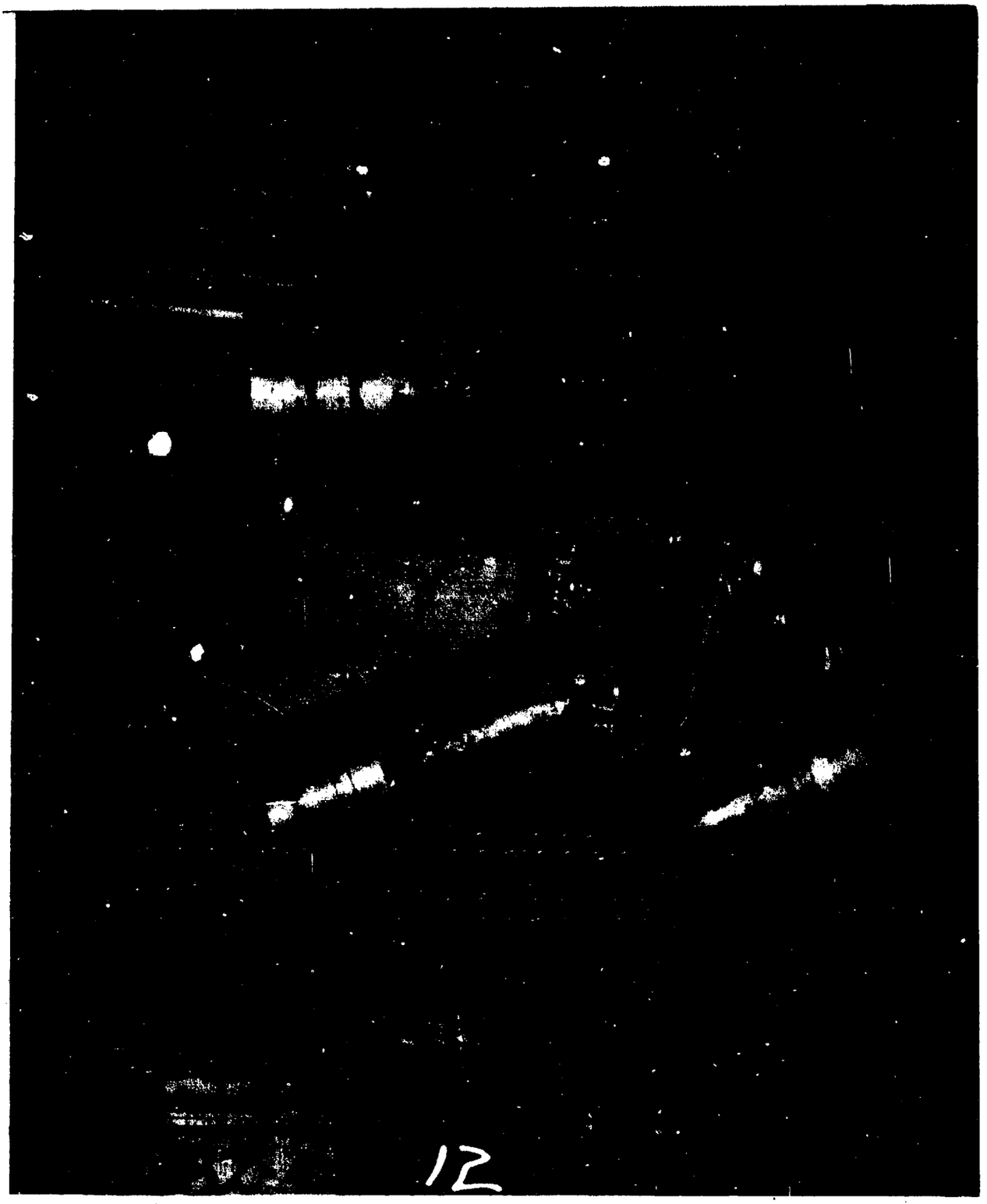
AB-CR-68-2953-8. Broken blower foundation in after dynamo room, C-24.

AB-CR-68-2953-9. Broken blower foundation in after dynamo room, C-24.

AB-CR-62-4164-4. Turret 5, projectile transfer level, left side, showing disarrangement of projectiles.

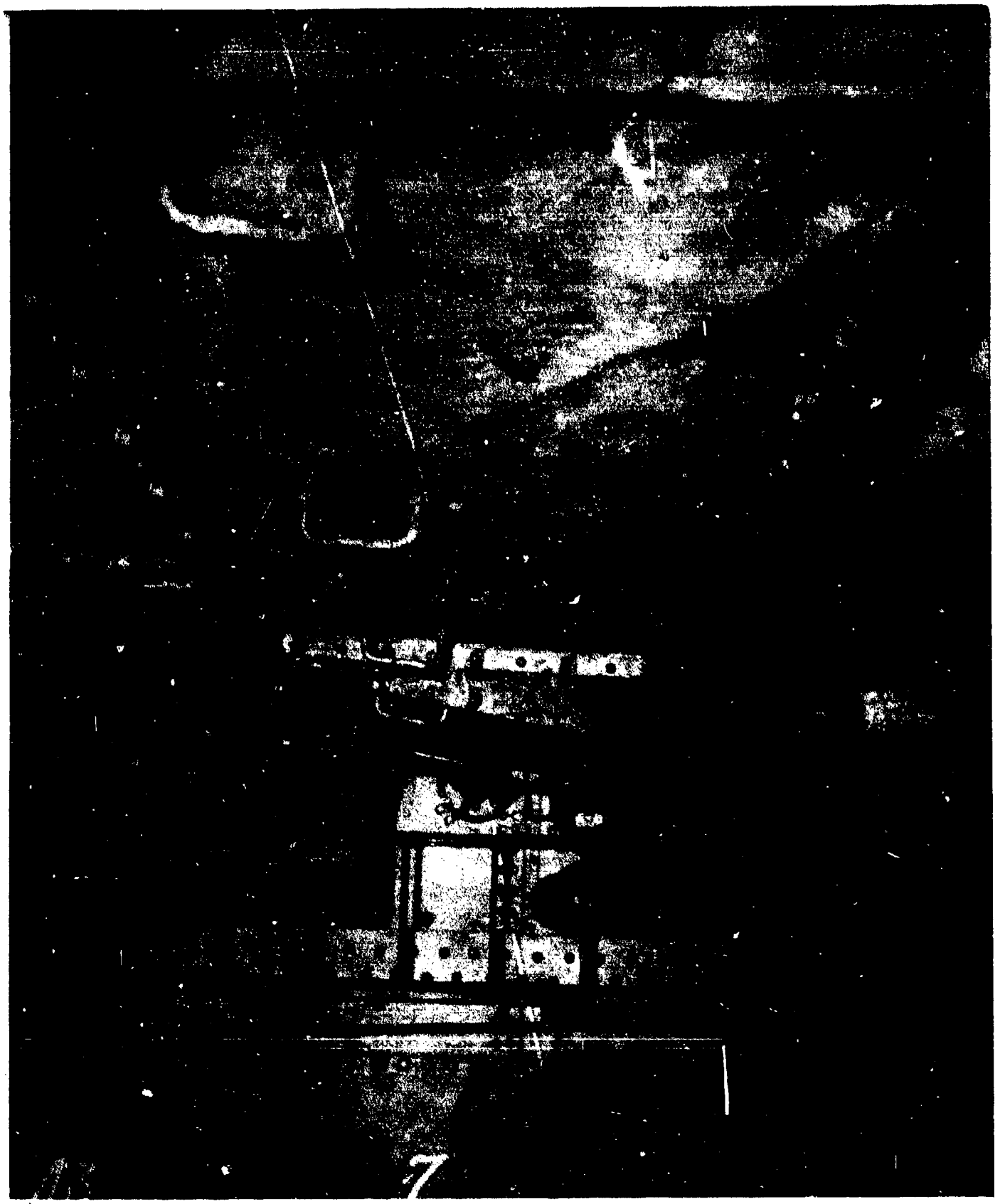


AB-CR-82-4222-11. Turret 4, projectile transfer level, left side, showing disarrangement of projectiles.

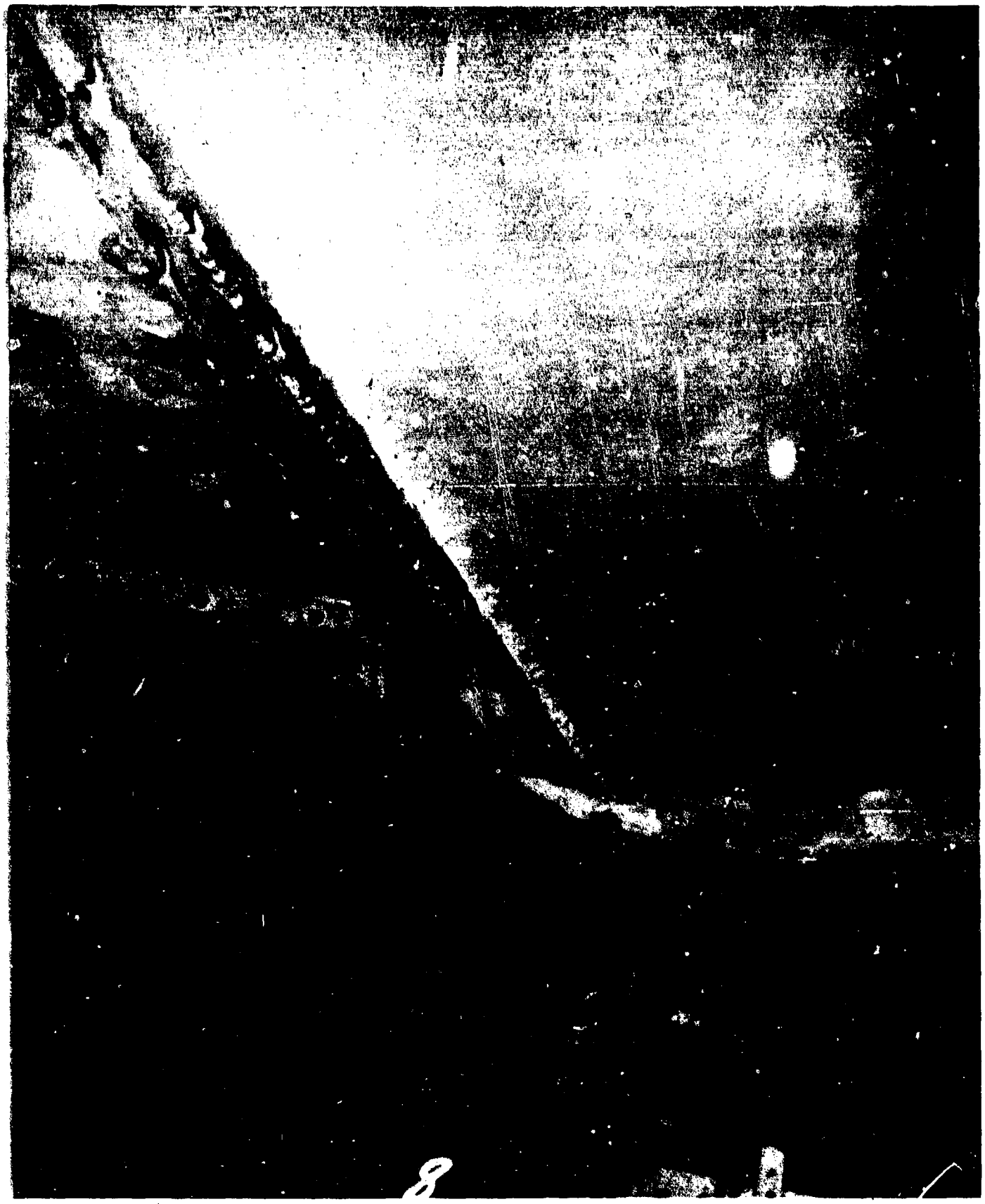


AB-CR-82-4222-12. Turret 4, projectile stowage level, right side, showing disarrangement of projectiles.

AB-CR-62-4164-3. 14" shell stowage, D-36-MS, adjacent to lower handling room of Turret 4, looking forward and inboard at disarrangement of projectiles.



AB-CR-62-4163-7. No. 4 boiler, inboard side casing.



AB-CR-62-4163-8. No. 4 boiler, inboard side casing.

AB-CR-62-4163-6. No. 2 boiler, rear wall at peak.

APPENDIX

SHIP MEASUREMENT DIAGRAM

APPENDIX

SHIP MEASUREMENT DATA

A. Deck Survey.

Radiological condition prevented survey of the deck after Test B. There is no evidence which indicates that the ship has any twist or permanent hog or sag.

B. Deck Deflection Scratch Gages.

Six deck deflection scratch gages were installed to record relative movement between the second and main decks. A tabulation of the locations and readings of these gages is on page 126.

SECRET

DECK DEFLECTION GAGES

SHIP U.S.S. NEW YORK (BB-34) **TEST** B

LOCATION			MAXIMUM COMP.	MAXIMUM EXP.	PERMANENT SET		REMARKS
FR. NO.	DECK	DIST. OFF ℄			DISTANCE	EXP./COMP.	
10	2ND	CENTER L.	0-0-3/16	NONE	NONE	NONE	NONE
39	"	PORT 28'	0-0-1/16	"	"	"	"
39	"	STBD 26'	0-0-1/8	"	"	"	"
85	"	PORT 22'	0-0-1/2	0-0-1/4	"	"	"
108	"	STBD 28'	0-0-1/16	NONE	"	"	"
123	"	CENTER L.	0-0-1/2	0-0-3/16	"	"	"

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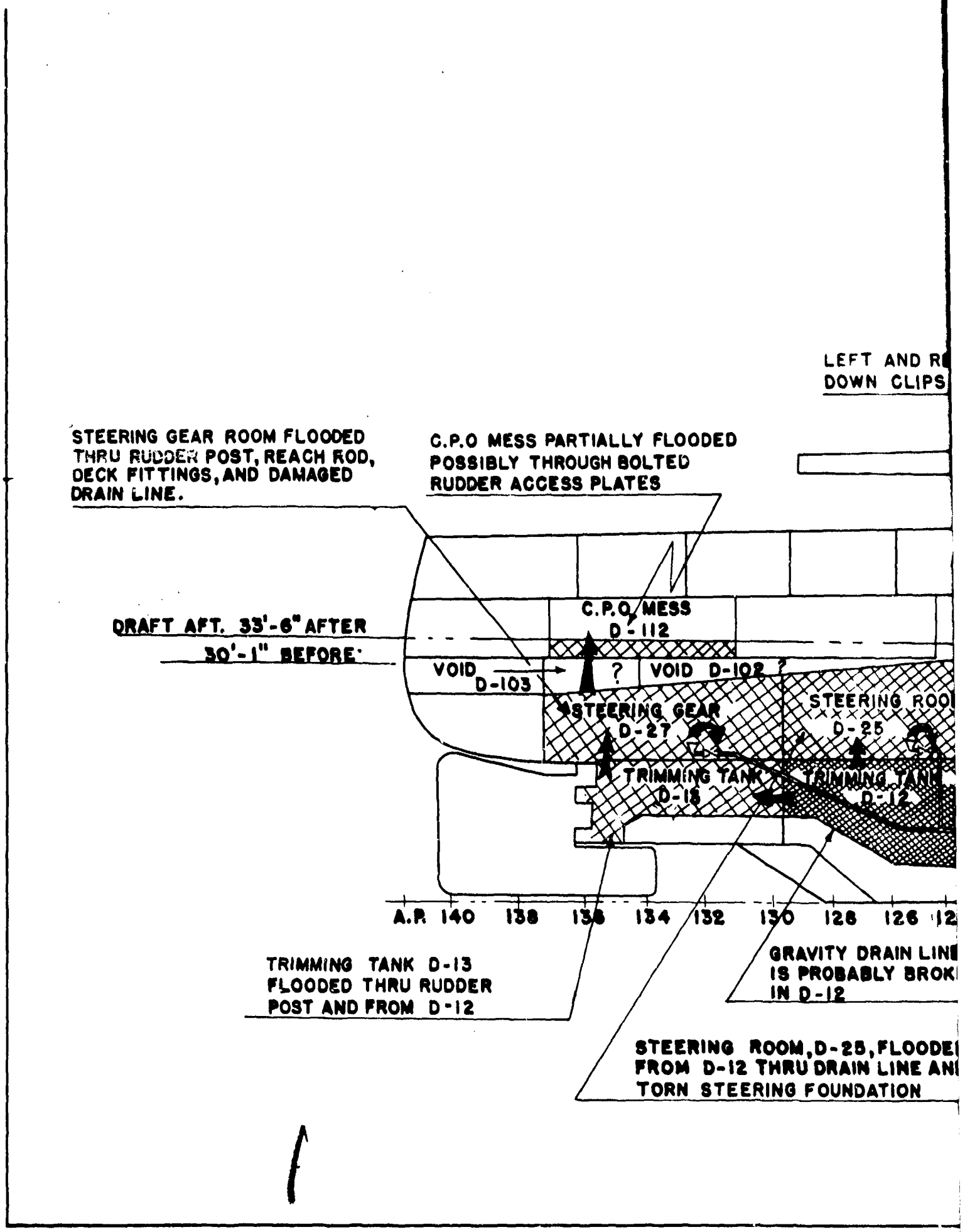
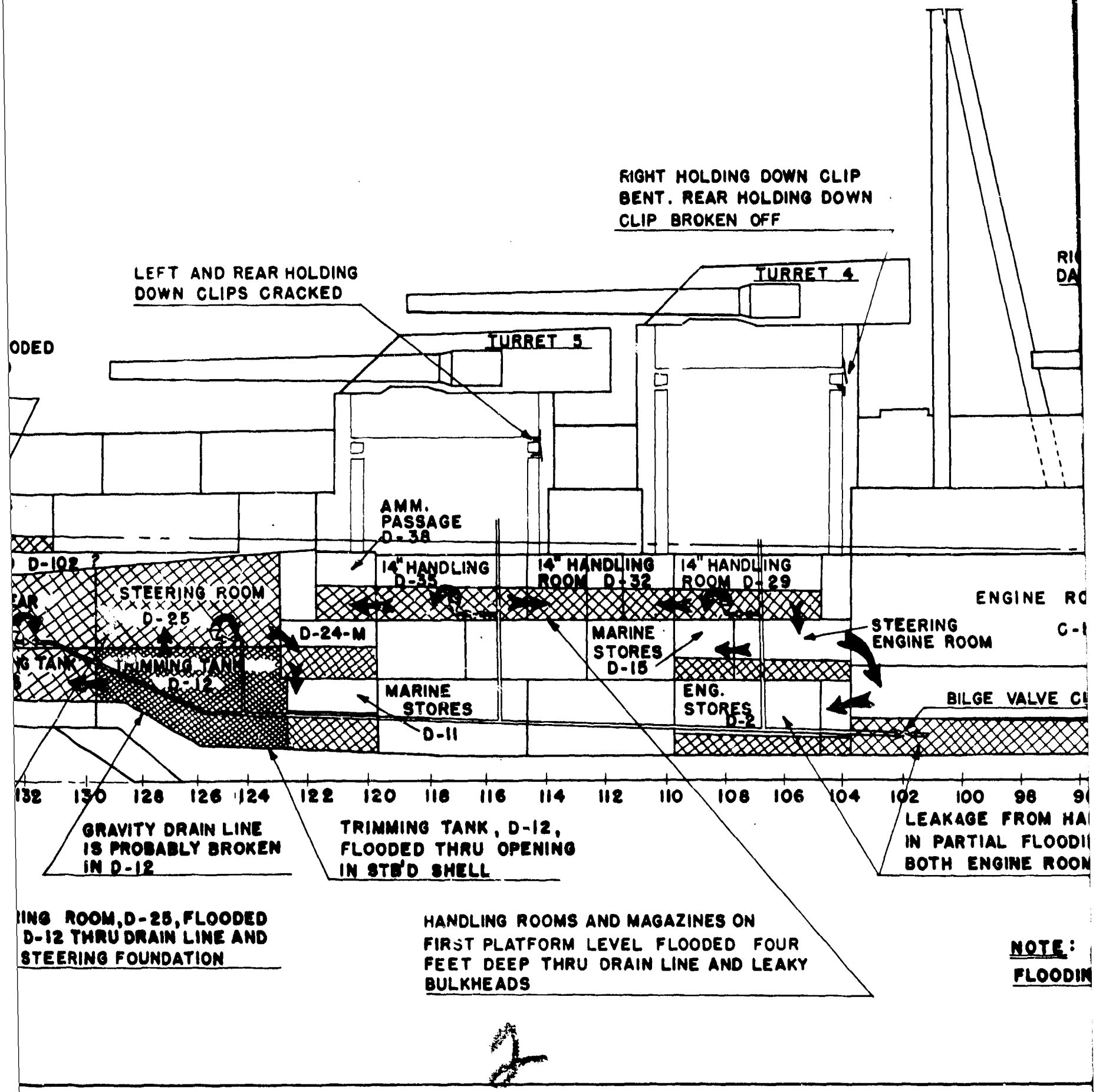
APPENDIX

SHIP DAMAGE DIAGRAM

TEST BAKER


LEFT AND R
DOWN CLIPS
STEERING GEAR ROOM FLOODED THRU RUDDER POST, REACH ROD, DECK FITTINGS, AND DAMAGED DRAIN LINE.
C.P.O MESS PARTIALLY FLOODED POSSIBLY THROUGH BOLTED RUDDER ACCESS PLATES
DRAFT AFT. 33'-6" AFTER
30'-1" BEFORE
C.P.O. MESS
D-112
VOID D-103
?
VOID D-102
STEERING GEAR
D-27
STEERING ROO
D-25
TRIMMING TANK
D-13
TRIMMING TANK
D-12
A.R 140 138 136 134 132 130 128 126 12
TRIMMING TANK D-13
FLOODED THRU RUDDER
POST AND FROM D-12
GRAVITY DRAIN LIN
IS PROBABLY BROK
IN D-12
STEERING ROOM, D-25, FLOODE
FROM D-12 THRU DRAIN LINE AN
TORN STEERING FOUNDATION


RIGHT HOLDING DOWN CLIP BENT. REAR HOLDING DOWN CLIP BROKEN OFF
LEFT AND REAR HOLDING DOWN CLIPS CRACKED
TURRET 4
TURRET 5
ODED
AMM. PASSAGE D-38
14" HANDLING D-35
14" HANDLING ROOM D-32
14" HANDLING ROOM D-29
D-102
STEERING ROOM D-25
D-24-M
MARINE STORES D-15
STEERING ENGINE ROOM
ENGINE RO
TRIMMING TANK D-12
MARINE STORES D-11
ENG. STORES D-2
BILGE VALVE CL
132 130 128 126 124 122 120 118 116 114 112 110 108 106 104 102 100 98
GRAVITY DRAIN LINE IS PROBABLY BROKEN IN D-12
TRIMMING TANK, D-12, FLOODED THRU OPENING IN STB'D SHELL
LEAKAGE FROM HA IN PARTIAL FLOODI BOTH ENGINE ROOM
ING ROOM, D-25, FLOODED D-12 THRU DRAIN LINE AND STEERING FOUNDATION
HANDLING ROOMS AND MAGAZINES ON FIRST PLATFORM LEVEL FLOODED FOUR FEET DEEP THRU DRAIN LINE AND LEAKY BULKHEADS
NOTE: FLOODIN

RIGHT GUN ELEVATING GEAR
DAMAGED BY SHOCK

REAR AND RIGHT HOLDING
DOWN CLIPS BENT

TURRET 3

ENGINE ROOM

STEERING
ENGINE ROOM

C-1

BILGE VALVE CLOSED

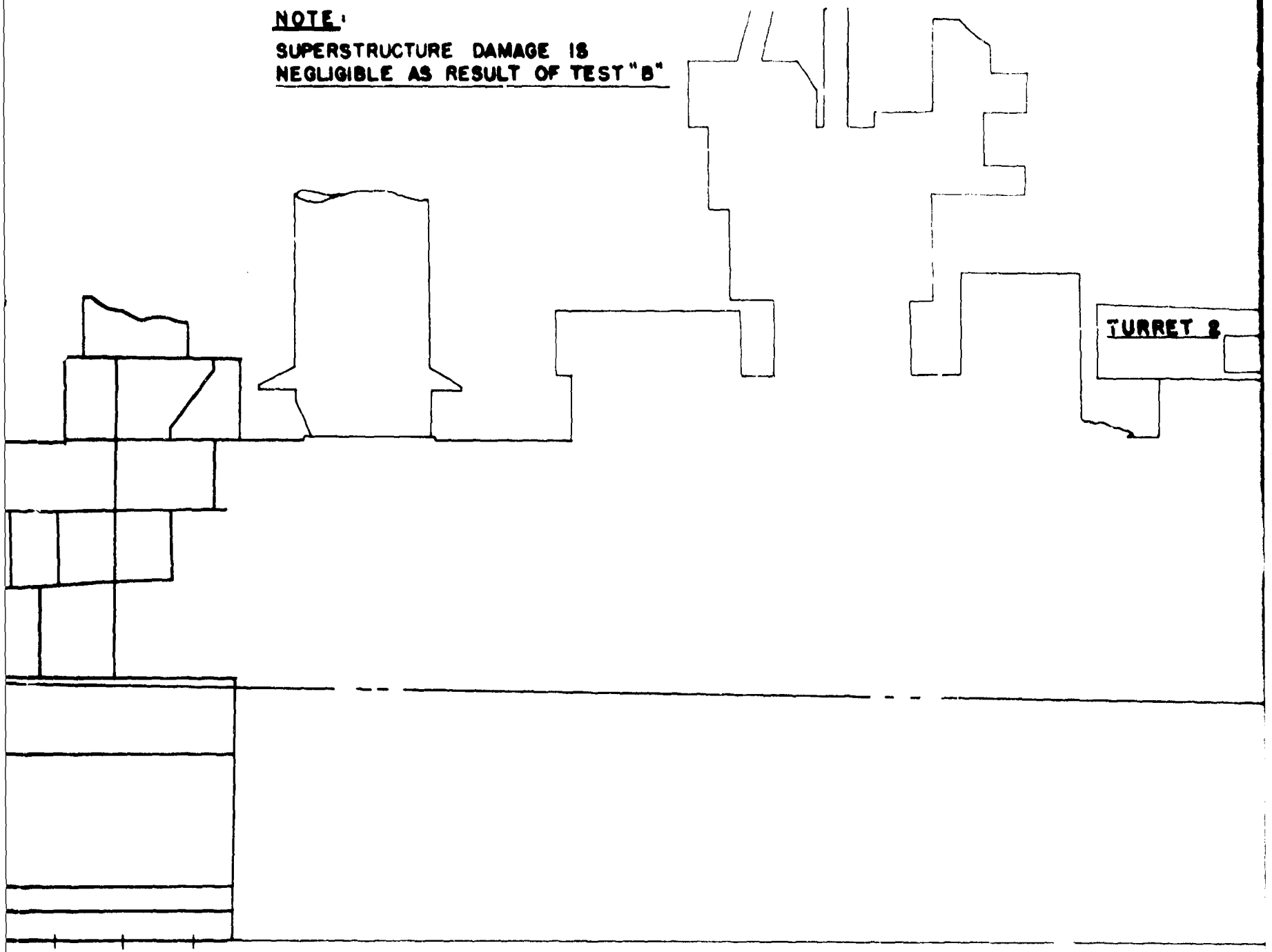
102 100 98 96 94 92 90 88 86 84 82 80 78 76 74 72 70

LEAKAGE FROM HANDLING ROOM D-29 RESULTED
IN PARTIAL FLOODING OF STEERING ENGINE ROOM,
BOTH ENGINE ROOMS AND SEVERAL STOREROOMS.

NOTE:
FLOODING IN WING TANKS NOT SHOWN

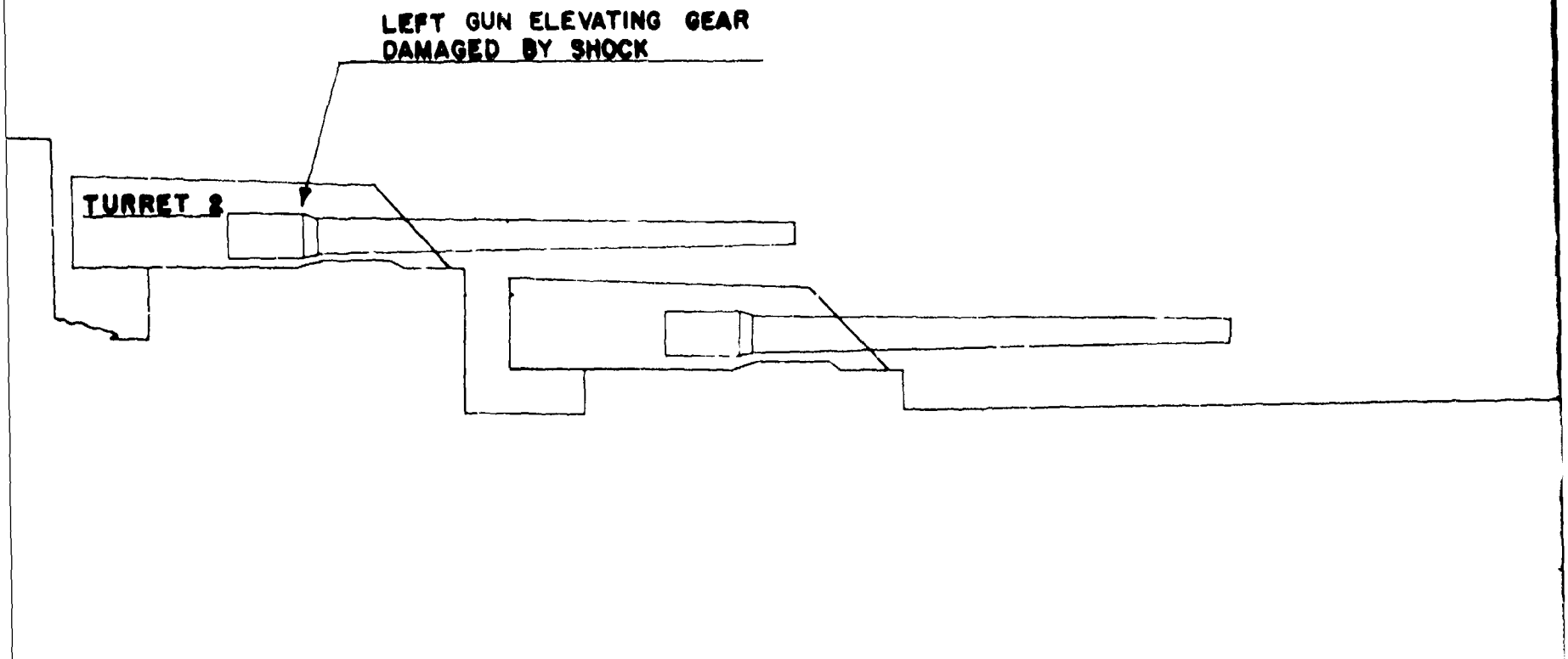
5

NOTE:
SUPERSTRUCTURE DAMAGE IS
NEGLIGIBLE AS RESULT OF TEST "B"



COMPARTMEN
UNINSPECTE
PROBABLY

SOURCES O
FLOODING



LEGEND

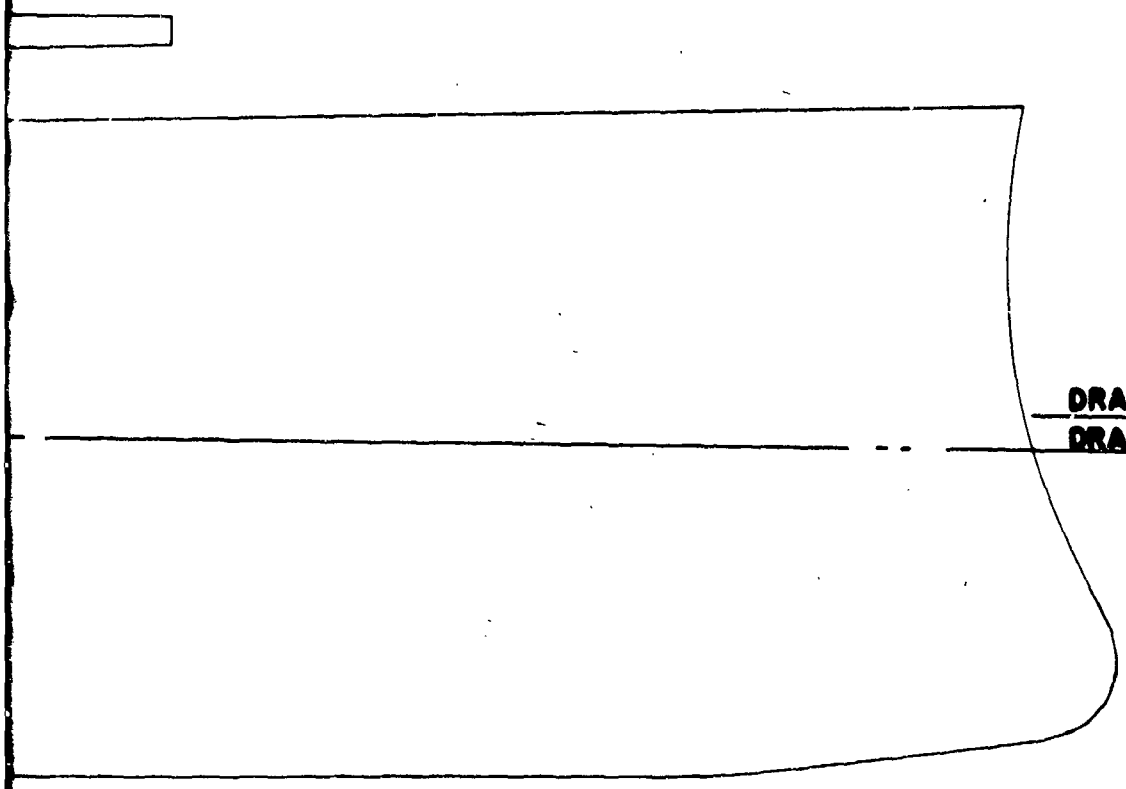
COMPARTMENTS UNINSPECTED BUT PROBABLY FLOODED ?

SOURCES OF FLOODING →

SLOW FLOODING

RAPID FLOODING

5



DRAFT FOR'D 26'-0" BEFORE
DRAFT FOR'D 25'-6" AFTER

6

NAVY DEPT BUREAU OF SHIPS

DAMAGE
TEST B

U.S.S NEW YORK BB 34

APPENDIX

COMMANDING OFFICERS REPORT

TEST BAKER

TECHNICAL INSPECTION REPORT

PART A - GENERAL SUMMARY

I. Target Condition After Test.

(a) Drafts after test; list; general areas of flooding, sources.

Forward 25′ 9″, aft 34′. 1° list. Port Group "D" below third deck. Open seams frame 110 port and 125 starboard.

(b) Structural damage.

After bulkhead of Captain's Sea Cabin dished in 8″. One port glass broken, flag bags distorted, apron around stack dished in about 2′ all around. Hatch #163 bulged up 4″. Inboard and after bulkheads of C-104 buckled. Trunk D-38 going to D-11 starboard bulkhead dished in about 2″ hold deck. Fairing plate frame #122 second deck cracked and sprung upward.

(c) Operability.

Main electrical plant operable. All machinery operable except for machinery in flooded areas. Turret #1 train drive has failed due to open circuits on controller. Turrets #2 and #3 have broken ball races on the oscillation block as does turret #4 and it is impossible to elevate the port guns. Turrets #4 and #5 were flooded making it impossible to energize. 40MM power drives were ruined due to blast and shock. Secondary Battery Directors #3 and #4 have been demolished by blast and MK 50 Director forward has crosslevel arm mechanism and rangefinder jarred loose. Forward MK III radar antenna was carried away by blast. Main frame Keyer tube (701A) and magnetron (700) were broken. After MK III also had broken magnetron and Keyer tube. Forward MK 10 Radar short circuited. SK Indicator jarred loose from bulkhead and damaged leads making it impossible to operate main frame.

(d) Heat; fires; estimated personnel casualties.

No evidence of any intensive heat or fire.

II. Forces Evidenced And Effects Noted.

(a) Heat.

Heat evidence could not be observed.

(b) Fires and explosions.

None.

(c) Shock.

T here was evidence of shock topside from port quarter. Light structural bulkheads on boat deck and superstructure was dished and distorted. Ordnance equipment was affected mostly amidships between the mainmast and foremast.

(d) Pressure.

Pressure on underwater body of hull opened seams and sheared rivets port and starboard aft. Frame #110 and #125 and skeg is bent and distorted.

(e) Any effects apparently peculiar to the atom bomb.

Radioactivity precluded making detailed inspection.

III. Results of Test on Target.

(a) Effect on propulsion and ship control.

Not tested.

(b) Effect on gunnery and fire control.

Main battery and 40MM guns put out of commission. Fire control in all batteries is unable to operate efficiently from exposed stations.

(c) Effect on watertight integrity and stability.

See Enclosure (C).

(d) Effect on personnel and habitability.

All personnel in exposed stations would probably would have suffered severe casualties.

(e) Total effect on fighting efficiency.

Gunnery efficiency would have been reduced approximately 70%.

IV. General Summary of Observers' Impressions and Conclusions.

Blast apparently came from port quarter and cut through the ship between the mainmast and foremast. Pressure of the falling water must have been very great to effect the port guns of Turrets #2, #3 and #4 as it did.

V. Any Preliminary General or Specific Recommendations of the Inspecting Group.

Again it becomes apparent that exposed personnel must be cut to a minimum and all superstructure must be streamlined in order to prevent trapping of blast.

DETAILED DESCRIPTION OF HULL DAMAGE

A. General Description of Hull Damage.
Opened seams aft.

(a) Overall condition of vessel.

Good

(b) General areas of hull damage.

Frames 120 port and 125 starboard.

(c) Apparent causes of hull damage in each case.

Shock.

(d) Principal areas of flooding with sources.

Group "D" flooding from drain lines and bulkhead packing glands on steam steering shaft. Doors and hatches not watertight.

(e) Residual strength, buoyancy and effect of general condition of hull on operability.

B. Superstructure (exclusive of gun mounts).

(a) Description of damage, giving important dimensions.

1. Bridge area.

After bulkhead of Captain's Sea Cabin dished in 8". One port glass broken, flag bags distorted.

2. Midship deckhouse and stacks.

Apron around stack dished in 2'.

3. After deckhouse and tower.

None.

(b) Cause of damage in each area.

Blast.

(c) Evidences of fire in superstructure.

None.

(d) Estimate of relative effectiveness against heat and blast of:

1. Various plating thicknesses.

Plating 3/8'' and above not affected.

2. Various shaped surfaces.

All dished surfaces were flat.

3. STS compared to MS.

Not enough damage to make comparison.

4. Aluminum structures (where fitted).

None fitted.

(e) Constructive criticism of superstructure design or construction, including important fittings and equipment.

It is believed that curved surfaces should be incorporated in future superstructure design whenever possible.

C. Turrets, Guns and Directors.

(a) Protected mounts.

1. General condition, including operability, if known.

Right gun of turret #2 and left gun of turret #3 are only guns operable in main battery.

2. Effectiveness of installed turrets or shields.

Damage to turrets #2, #3 and #4 was transmitted from barrel through trunnion to elevating screw. The protection of the turret itself did not fail.

(b) Unprotected mounts.

1. General condition, including operability, if known.

All guns are operable with the exception of 40MM mounts #2 and #9.

2. Effectiveness and sufficiency of crew shelters.

No port shield is sufficient, the crew must be completely enclosed.

(c) Directors and range-finders.

1. General condition, including operability, if known.

Optically unimpaired. Failure of cast aluminum pedestals and mounting disabled three directors.

2. Condition of instruments therein.

Fair condition.

(d) Constructive criticism of design or construction of mounts, directors, foundations and shelters.

Foundations and shelters must be stronger.

D. Torpedo Mounts, Depth Charge Gear.

None mounted.

E. Weather Deck (Flight Deck on Aircraft Carriers).

Not applicable to this ship.

F. Exterior Hull (above waterline).

(a) Condition of exterior hull plating and causes of damage.

None.

(b) Condition of exterior hull fittings and causes of damage.

Port quarter boat boom fitting pulled from hull, boom broken.

(c) Details of any impairment of sheer strakes.

None.

(d) Condition of side armor belt, if fitted externally.

Intact.

G. Interior Compartments (above waterline or armor deck), if fitted.

(a) Damage to structure and causes.

None.

(b) Damage to joiner bulkheads and causes.

Inboard and after bulkheads of C-104 buckled.

(c) Details of damage to access closures and fittings.

Hatch #163 bulged up 4''.

(d) Condition of equipment within compartments.

Good.

(e) Evidence of fire.

None.

(f) Damage in way of piping, cables, ventilation ducts, etc.

Good.

(g) Estimate of reduction in watertight subdivision, habitability and utility of compartments.

No change.

H. Armor Deck (s) (if fitted).

(a) Damage to armor deck and causes of damage.

Fairing plate frame 122 cracked.

(b) Protection afforded spaces below.

Good.

(c) Condition around openings.

Good.

1. Hatches.

Good.

2. Gratings.

Good.

3. Uptake bulkheads.

Good.

4. Barbettes.

Good.

(d) Condition of connections to vertical armor.

Good.

I. Interior Compartments (below waterline).

(a) Damage to structure and causes.

Web frames distorted in D-26-P.

(b) Damage to joiner bulkheads and causes.

None.

(c) Details of damage to access closures and causes.

None.

(d) Condition of equipment within compartments.

Good.

(e) Flooding.

Group "D".

(f) Damage in way of piping, cables, ventilation ducts, shafts, etc.

None.

(g) Estimate of reduction in watertight subdivision, habitability, and utility of spaces.

No change.

J. Underwater Hull.

(a) Interior inspection of underwater hull.

Not inspected.

(b) Effect of damage on buoyancy, operability, maneuverability.

No change.

(c) Any known or suspected damage to:

1. Shafts and propellers.

None.

2. Struts.

None.

3. Rudders.

None.

4. External keels.

None.

(d) Details of impairment of keel structure.

None suspected.

K. Tanks.

(a) Condition of tanks in areas of damage.

D-92-F and D-94-F flooded.

(b) Contamination liquids.

1. Extent and cause, if known.

Not known.

2. Effect on ship operability.

None.

(c) Damage (known or suspected) to torpedo systems.

None suspected.

L. Flooding.

(a) Description of major flooding areas.

C-17, D-11, D-12, D-13, D-18-M, D-31-M, D-22M, D-24-M, D-25, D-26-Pand S, D-27, D-29, D-32, D-35, D-37, D-92-F, D-94-F.

(b) Sources of flooding.

Open seams in D-12 and D-13, flooding through drain lines, bulkhead packing glands and non-watertight doors and hatches.

1. Opened boundaries.

D-12, D-13, D-92-F, D-94-F.

2. Damaged or poorly designed system or fittings; as, access closures, piping, wiring, ventilation ducts, etc.

None evident.

(c) List of compartments believed to have flooded slowly so as to be susceptible to dar age control.

C-17, D-11, D-18-M, D-21-M, D-22-M, D-24-M, D-26-PandS, D-29, D-32, D-35 and D-37.

M. Ventilation (exclusive of blowers).

(a) Damage to ventilation system and causes.

Not inspected.

(b) Evidences that ventilation system conducted heat, blast, fire or smoke below decks.

None.

(c) Evidences that ventilation system allowed progressive flooding.

None.

(d) Constructive criticism of design and construction of system.

None due to old design of vent system as installed in this vessel.

N. Ship Control.

(a) Damage to ship control stations and causes.

1. Bridge area.

None.

2. C.I.C.

Excellent condition with exception of SK Indicator and SG Synchro amplifier and transmitter which were torn from bulkhead.

3. Gyro-compass equipment.

Main gyro inoperable. Bridge repeaters grounded. Inspected but not operated.

4. Steering gear.

Steering gear room flooded.

5. Interior communications.

No damage.

(b) Constructive criticism of ship control systems.

1. Layout and arrangement.

None.

2. Location with respect to protection.

Location of ship control instruments within the foremast tower, as is the practice in some modern capital ships, would probably afford adequate protection in all directions.

O. Fire Control.

(a) Damage to fire control stations and causes.

All exposed Fire Control stations were damage to some extent by blast.

1. Directors and elevated control positions.

Main Battery Directors #2 and Secondary Director Batterys #3 and #4 experienced failures of castings.

2. Plot rooms and protected spaces.

Locatio should be on more substantial structures.

P. Ammunition Behavior.

(a) Ready service ammunition, location, protection, behavior under heat and blast.

1. Main battery.

"D" Group was flooded and 2 magazines have either fumes - otherwise excellent.

2. Secondary battery.

Excellent.

3. 40mm, 20mm and other.

Excellent.

(b) Magazines, location, protection, forces involved, behavior.

1. Main battery powder and projecticles.

Good location and protection - no forces involved, good condition.

2. Secondary battery.

Same as Main Battery with exception of topside stowage which is totally unprotected.

3. 40mm, 20mm and other.

Below decks magazines are situated well but topside stowage has little protection - condition is good.

4. Bomb, mine, depth charge and torpedo stowage.

Good.

(c) List of stowages which are insufficiently protected and effects on ship survival of explosion of each stowage.

All topside AA magazines. None. 5"/51 Cal. located in Aircastle. None.

(d) Behavior of gasoline stowage facilities.

Not inspected.

Q. Ammunition Handling.

(a) Condition and operability of ammunition handling devices.

Good.

1. Main battery hoists.

Good.

2. Secondary battery hoists.

Good.

3. Passing scuttles.

Good.

4. Bomb and Torpedo Elevators.

None.

(b) Evidences that any ammunition handling devices contributed to passing of heat, fire, blast or flooding water.

None.

(c) Constructive criticism of design and construction of ammunition handling devices.

None.

R. Strength.

(a) Permanent hog or sag.

None.

1. Hull evidence.

None.

2. Superstructure expansion joints, etc.

None in this vessel.

3. Local evidences of longitudinal stresses.

None.

(b) Shear strains in hull plating.

None.

(c) Evidences of transverse or racking strains.

None.

(d) Details of any local failures in way of structural discontinuities.

None.

(e) Evidence of panel deflection under blast.

None.

(f) Turret, machinery and gun foundations.

Holding down clips on turrets #4 and #5 failed.

S. Miscellaneous.

(a) Evidence of heat damage variations under various colors of camouflage painting.

None.

(b) Other miscellaneous effects or conditions noted during inspection.

None.

DETAILED DESCRIPTION OF MACHINERY DAMAGE

A. General Description of Machinery Damage.

(a) Overall condition.

Good.

(b) Areas of major damage.

C-1, D-1, D-3, D-7, D-9, D-25, and D-27.

(c) Primary causes of damage in each area of major damage.

Progressive flooding.

(d) Effect of target test on overall operation of machinery plant.

Very little effect.

B. Boilers (S-51).

(a) Air casings.

Forward outboard panel of #1 boiler and after inboard panel of #4 boiler was blown out 6'' to 8''. No other apparent damage.

(b) External fittings (stop and check valves, safety valves, etc.(

No apparent damage, only #3 boiler tested by steam.

(c) Fuel oil burner assemblies.

No damage.

(d) Brick work and furnaces.

Plastic peaks in forward and after ends of all boilers loosened.

(e) Steam and water drums and headers.

No apparent damage. Only #3 boiler steam tested.

(f) Tubes (generating, superheater, downcomer, economizer).

No apparent damage. Only #3 boiler steam tested.

C. Blowers (S-53).

(a) Turbines or motors.

No apparent damage. Only #3 blower tested by steam.

(b) Blowers.

No apparent damage. Only #3 blower tested by steam.

(c) Foundations.

No apparent damage.

(d) External fittings (gages, piping, oil coolers, etc.).

No apparent damage.

(e) Shutters (air intake, automatic, etc.).

No apparent damage.

(f) Blower rooms (air lockers if enclosed fireroom).

No apparent damage.

D. Fuel Oil Equipment (S-55).

(a) Heaters.

No apparent damage. Only #3 tested.

(b) Strainers.

No apparent damage.

(c) Manifolds.

No apparent damage.

(d) Fittings (thermometers, gages).

No apparent damage.

E. Boiler feedwater equipment (S-56).

(a) Heaters.

No apparent damage. Only starboard heater tested.

(b) Deaerating tanks.

None on ship.

(c) Feed-water tanks (hot well, filter, etc.).

No apparent damage.

(d) Miscellaneous. No apparent damage.

F. Main Turbines (S-41).

None on U.S.S. NEW YORK.

Main reciprocating engines.

(a) Casings.

No apparent damage.

(b) Bearings.

Starboard main engine crank pit was flooded with salt water over all bearings. Otherwise no apparent damage.

(c) Rotors.

None on ship.

(d) Blading and shrouding.

None on ship.

(e) Packing and glands.

Not tested.

(f) Valves.

Not tested.

(g) Foundations.

No apparent damage.

(h) Fittings (oilsights, thermometers, clearance indicators, etc.).

No apparent damage.

(i) Turning gears.

No apparent damage, except starboard jacking motor flooded with sea water.

G. Reduction gears (S-42).

None on ship.

H. Shafting and bearings (S-43).

(a) Shafting.

Not tested.

(b) Bearings and bearing foundations.

Spring bearings and thrusts and steady bearings on starboard shaft flooded.

(c) Alignment.

Not tested.

(d) Stern tubes, bulkhead packing glands, etc.

Bulkhead packing glands on steam steering shaft leaks.

I. Lubrication system (S-45).

(a) Coolers.

Not tested.

(b) Filters and strainers.

Not tested.

(c) Purifiers.

Starboard purifier flooded.

(d) Tanks (sump, settling, etc.).

#3 and #4 settling tanks were lifted about 3''.

(e) Fittings (gauges, etc.).

Gauge glasses on #3 and #4 settling tanks were broken, and bottom gauge glass fittings were bent down and broken.

J. Condensers and air ejectors (S-46).

(a) Water boxes.

No damage.

(b) Shell and shell connections.

Holding down bolts on after dynamo condensers were loosened.

(c) Expansion joints.

None on condenser lines.

(d) Air ejectors.

None on ship.

(e) Inter and after condensers.

None on ship.

(f) Miscellaneous valves, gages, fittings and attached piping.

No damage.

K. Pumps (S-47).

(a) Feed pumps.

None tested except #2 auxiliary feed pump which operated satisfactory.

(b) Circulating pumps.

Not tested. Starboard pump crankcase flooded.

(c) Wet Air Pumps.

No damage.

(d) Fire pumps.

After diesel fire pump flooded. #12 electric fire pump in D-3 flooded.

(e) Lub oil pumps.

No apparent damage.

(f) Fuel oil pumps.

No damage.

(g) Other pumps.

Bilge pumps. No damage.

L. Auxiliary Generators (Turbine and Gears) (S-61).

(a) Foundations and misalignment.

No damage. Only #2 turbo generator tested by steam, satisfactory.

(b) Turbines.

No damage. Only #2 tested.

(c) Gears.

No damage. Only #2 tested.

(d) Coolers.

No damage. Only #2 tested.

(e) Governors.

No damage. Only #2 tested.

(f) Valves, fittings, etc.

No damage. Only #2 tested.

M. Propellers (S-44).

(a) Blades.

No apparent damage.

(b) Caps, nuts, etc.

No apparent damage.

N. Distilling Plant (S-58).

(a) Evaporators.

Holding down bolts on all but starboard effect was loosened.

(b) Distilling condensers.

Not tested.

(c) Evaporator feed heaters.

Not tested.

(d) Miscellaneous valves, fittings, gages, attached piping, etc.

Not tested.

O. Refrigerating Plant (S-59).

(a) Compressors.

Not tested.

(b) Motors.

Not tested.

(c) Condensers.

Not tested.

(d) Foundations.

No apparent damage.

(e) Refrigerant piping and cooling coils.

Not tested.

(f) Insulation and lagging.

No damage.

(g) Miscellaneous valves, switches, controls, fittings, etc.

No damage.

P. Winches, Windlasses, and Capstans (S-20, 26).

(a) Foundations and bedplates.

Good.

(b) Motors.

Good.

(c) Brakes and brake lining.

Good.

(d) Gearing.

Good.

(e) Hydraulic systems.

None on ship.

(f) Drums, bearings, shafting.

Good.

(g) Fittings, wildcats, valves, etc.

Good.

Q. Steering engine (S-22).

(a) Foundations.

Good.

(b) Ram, quadrant, chains, screws, etc.

Good.

(c) Hydraulic system, including pumps, piping, etc.

No apparent damage, except from flooding.

(d) Follow up system.

Not inspected.

(e) Motors and Engines.

Electric steering motor in D-25 flooded.

(f) Miscellaneous (Steering stands, gages, etc.).

None.

R. Elevators, Ammunition Hoists, etc. (S-78, 83).

(a) Machinery foundations.

No damage.

(b) Motors and gearing.

No apparent damage. Inspected but not operated.

(c) Hydraulic systems.

No damage.

(d) Guide rails, dredger chains, etc.

No damage.

(e) Elevator platforms.

No damage.

(f) Brakes and brake lining.

No damage.

(g) Control systems and follow up gear.

No damage.

(h) Miscellaneous.

None.

S. Ventilation (Machinery) (S-38).

(a) Fans and motors.

Vent Set 5-80-1 foundation broken.

(b) Foundations and mountings.

Vent set 5-80-1 Foundation broken.

(c) Heaters.

Not tested.

T. Air Compressors (S-49).

(a) Foundations.

No damage.

(b) Compressors and motors.

Starboard air compressor in C-1 flooded.

(c) Coolers.

tested.

(d) Tanks.

Not tested.

(e) Miscellaneous gages, attached piping, etc.

Not tested.

U. Diesels (Generators and Boats) (S-50).

(a) Foundations.

After Diesel Generator Room flooded. Diesel frozen; could not be jacked over. Forward Diesel Generator operated satisfactorily.

(b) Casings and cylinders.

Same as (a).

(c) Bearings, crankshafts, pistons, etc.

Same as (a).

(d) Fuel injection system.

Same as (a).

(e) Superchargers.

None.

(f) Governors.

Same as (a).

(g) Miscellaneous.

Same as (a).

V. Piping.

(a) Main steam.

No damage.

(b) Auxiliary steam.

No damage.

(c) Auxiliary exhaust.

No damage.

(d) Condensate and feed water.

No damage.

(e) Fuel and feed water.

No damage.

(f) Lub Oil.

No damage.

(g) Firemain, sprinkling, and water curtain.

No damage.

(h) Conderser circulating water.

No damage.

(i) Drain.

No damage.

(j) Compressed air.

No damage.

(k) Hydraulic.

No damage. Hydraulic System port and starboard cranes operated satisfactorily.

(1) Gasoline.

Not inspected.

SECTION III

PART C - INSPECTION REPORT

SECTION C - ELECTRICAL

A. General Description of Electrical Damage.

(a) Overall Condition.

Slight damage due to flooding. Navigation and Ship's Control Equipment inoperable.

(b) Areas of Major Damage.

Navigation Bridge, C-1, D-1, D-3, and D-25.

(c) Primary Causes of Damage in Each Area of Major Damage.

All damage below decks due to flooding. Damage on Navigation Bridge due to decontamination spraying.

(d) Operability of Electrical Plant.

Main Plant; no apparent damage. Forward main generators operated satisfactorily. After main generators inspected but not operated.

1. Ship's service generator plant.

No damage.

2. Engine and Boiler Auxiliaries.

Starboard engine jacking motor flooded.

3. Electrical Propulsion.

None aboard.

4. Communications.

No damage except in flooded compartments.

5. Fire Control Circuits.

No damage except in flooded areas.

6. Ventilation.

Vent Set 5-80-1. Foundation broken at holding down feet.

7. Lighting.

No damage except in flooded spaces.

(e) Types of Equipment Most Affected.

1. Switchboards and switchgear.

After Emergency switchboard grounded and shorted by flooding of D-1.

2. Rotating Machinery.

No damage. Inspected but not operated.

3. Motor Controllers.

No damage. Inspected but not operated.

4. Cables and Supports.

Cables in flooded compartments grounded. Feeders for steering motor carried water to wiring passageways Compt. C-17. Feeders are run in conduit.

B. Electric Propulsion Rotating Equipment.

None aboard.

C. Electric Propulsion Control Equipment.

None aboard.

D. Generators - Ship's Service (S61).

No damage.

E. Generators - Emergency (S61).

(a) Frame and Mountings.

No damage.

(b) Commutators. - After Diesel Generator Compartment D-1.

Commutator shorted and grounded due to flooding.

(c) Brushes and Brush Rigging.

Brush rigging grounded due to flooding on After Diesel Generator.

(d) Bearings.

No damage.

(e) Fans.

No damage.

(f) Balance Coils.

No damage.

F. Switchboards, Distribution and Transfer Panels (S62).

(a) Framework and Mountings.

No damage.

(b) Electrical Connections and Wiring - After Emergency Switchboard.

All wiring grounded due to flooding.

(c) Busbars.

No damage.

(d) Circuit Breakers, Contractors, Switches and Relays.

After Emergency Switchboard circuit breaker coils shorted and grounded due to flooding.

(e) Rheostats and Resistors.

After Emergency Switchboard rheostats grounded due to flooding. Not enough resistance to determine if shorted.

(f) Mechanical Operating Mechanisms and Interlocks.

No damage.

(g) Insulating Materials.

No damage.

(h) Instruments.

No apparent damage. After Emergency Switchboard instruments not tested.

(i) Rectifiers.

None.

(j) Fuses.

No damage.

(k) Voltage Regulators.

No damage.

G. Wiring, Wring Equipment, and Wireways (S62).

(a) Cable (Power, lighting, I.C., F.C., propulsion and degaussing.)

Cable in flooded compartments grounded.

(b) Wireway Supports.

No damage.

(c) Connection, junction boxes, receptacles, and plugs.

No damage.

H. Transformers (Lighting and I.C.) (S62).

(a) Framework and mountings.

None.

(b) Electrical connections.

No damage.

I. Submarine Propelling Batteries (S62).

None aboard.

J. Portable Batteries (S62).

(a) Mounting.

No damage.

(b) Jars.

No damage.

(c) Cell and Cable Connections.

No damage.

(d) Acid Spillage.

None.

K. Motors, Motor Generator Sets, and Motor Controllers (S63).

(a) Rotating Equipment.

1. Framework and Mounting.

Vent Set 5-80-1 - Mounting frame broken at feet.

2. Commutator or Slip Rings.

No apparent damage.

3. Brushes and Brush Rigging.

No apparent damage.

4. Bearings.

No apparent damage.

5. Speed Regulators.

No apparent damage.

(b) Control Equipment.

1. Framework and Mounting.

Control Panel for Vent Set 3-45-3; mounting bolts sheared off.

2. Electrical Connections and Wiring.

No apparent damage.

3. Contactors, Switches, and Relays.

No apparent damage.

4. Rheostats and Resistors.

No apparent damage.

5. Insulating Materials.

No apparent damage.

6. Pilot Circuit Devices.

No apparent damage.

7. Brakes.

No apparent damage.

L. Lighting Equipment (S64).

(a) Lamps (Rough Service, Rough Service High Impact, and Fluorescent Lights).

Fluorescent lights in Operating Room jarred from fixture and shattered.

(b) Reflectors.

No damage.

(c) Fixture Mounts.

No damage.

(d) Shock Mounts (U-Strap Type and Plate Type).

No damage.

(e) Pendant Lamp Holders.

No damage.

(f) Lamp Globes.

Lamp Globes in after part of ship shattered; lamps in fixtures undamaged.

M. Searchlights (36", 24", 12", and 8") (S66).

(a) Framework and Mountings.

No damage.

(b) Front Glass.

#1 36" searchlight front glass shattered in Test "A".
#2 36" searchlight front glass shattered in Test "B".

(c) Shutter and Operating Mechanism.

Both shutters on 36" searchlights distorted. Operating mechanism could not be tested because of distorted shutters.

(d) Locks and brakes.

No damage.

(e) Arc lamp feed rods.

36" searchlight lamp mechanism corroded due to decontamination spraying.

(f) Incandescent lamps.

No damage.

(g) Rheostats.

No damage.

N. Degaussing Equipment (S81).

(a) Compass Compensating coils and control boxes.

Grounded due to decontamination spraying.

(b) Connection Boxes.

No damage.

(c) Heading Switches and Relays.

No apparent damage.

O. Gyro Compass Equipment.

(a) Master.

Both master compasses had a number of suspension springs jarred loose causing spider frame to tilt. Mercury spilled out of bowls in both compasses.

(b) Repeaters.

Bridge repeaters grounded. No other apparent damage. Inspected but not operated.

(c) DRT and DRA.

No apparent damage. Inspected but not operated.

P. Sound Powered Telephones.

(a) Headsets.

No damage.

(b) Handsets.

No damage.

(c) Jack and Switchboxes.

No apparent damage.

(d) Stowage.

No damage.

Q. Ship's Service Telephones.

(a) Exchange.

No apparent damage.

(b) Line Equipment.

No apparent damage.

R. Announcing Systems.

(a) Portable (PAM and PAB);

None.

(b) Amplifier Racks.

None.

(c) Control Racks.

No damage.

(d) Transmitting Station.

No damage.

(e) Reproducers.

No damage.

(f) Intercommunication Units.

No apparent damage.

S. Telegraphs.

All telegraphs from Navigation Bridge grounded.

T. Indicating Systems.

All indicating systems connected to Navigation Bridge grounded. Rudder Angle Indicator grounded.

U. I.C. and A.C.C. Switchboards.

No damage.

V. F.C. Switchboards.

No damage.

SECTION III

PART C - INSPECTION REPORT

SECTION D - ELECTRONICS

A. General Description of Electronics Damage.

(a) Overall Condition.

Radar equipment suffered severe damage; radio equipment and other - good condition.

(b) Areas of Major Damage.

Confined to equipment above main deck.

(c) Primary cause of damage in each area.

Blast and shock.

(d) Operability of Electronics Equipment.

1. Radar.

Forward MK III Radar Antenna carried away by blast. SK Indicator was pulled from bulkhead of C.I.C. damaging leads. Slight shock effected all other radar.

2. Radio.

No major damage. Most of transmitters and receivers function normally.

3. Sonar.

No apparent damage.

4. Loran.

Blasted from mounting.

(e) Types of equipment most affected.

Radar - Radio Receiver power supply.

B. through V. - Other Electronics Equipment.

(a) Shipborne and Shore Electronics Equipment.

Portable equipment sustained no apparent damage.

(b) Army Electronics Equipment.

SCR 608 installed sustained no major damage.

Classification (Cancelled) (Changed to CONFIDENTIAL
By Authority of Joint Chiefs of Staff (Action 15 Apr 49)
By [redacted] Date 24 Jan 50

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

TRC 18 April 1997

Subject: Declassification of Report

AD-376836L	XRD-98
AD-376835L	XRD-97
AD-376834L	XRD-96
AD-376833L	XRD-95
AD-376832L	XRD-94 re-ingest
AD-367458	XRD-93
[redacted]	XRD-92-Volume 2
[redacted]	XRD-91-Volume 1
[redacted]	XRD-90
[redacted]	XRD-89
AD-367453	XRD-88
[redacted]	XRD-87
AD-366764	XRD-86
AD-376837L	XRD-99
AD-366758	XRD-78
AD-366734	XRD-44
AD-366763	XRD-85
AD-376829L	XRD-77
AD-367462	XRD-103
AD-367463	XRD-104
AD-367461	XRD-102
AD-367460	XRD-101

TRC 18 April 1997

Subject: Declassification of Reports

AD-801406L ✓ XRD-114?

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

Ardith Jarrett

ARDITH JARRETT
Chief, Technical Resource Center