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TECHNICAL INSPECTION REPORT

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U.S.S. NEW YORK (BB34)

Defense Atomic Support Agency
Washington, D. C. 20301

TEST ABLE

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U.S.S. NEW YORK (BB34)

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

SHIP CHARACTERISTICS

Building Yard: New York Naval Shipyard.

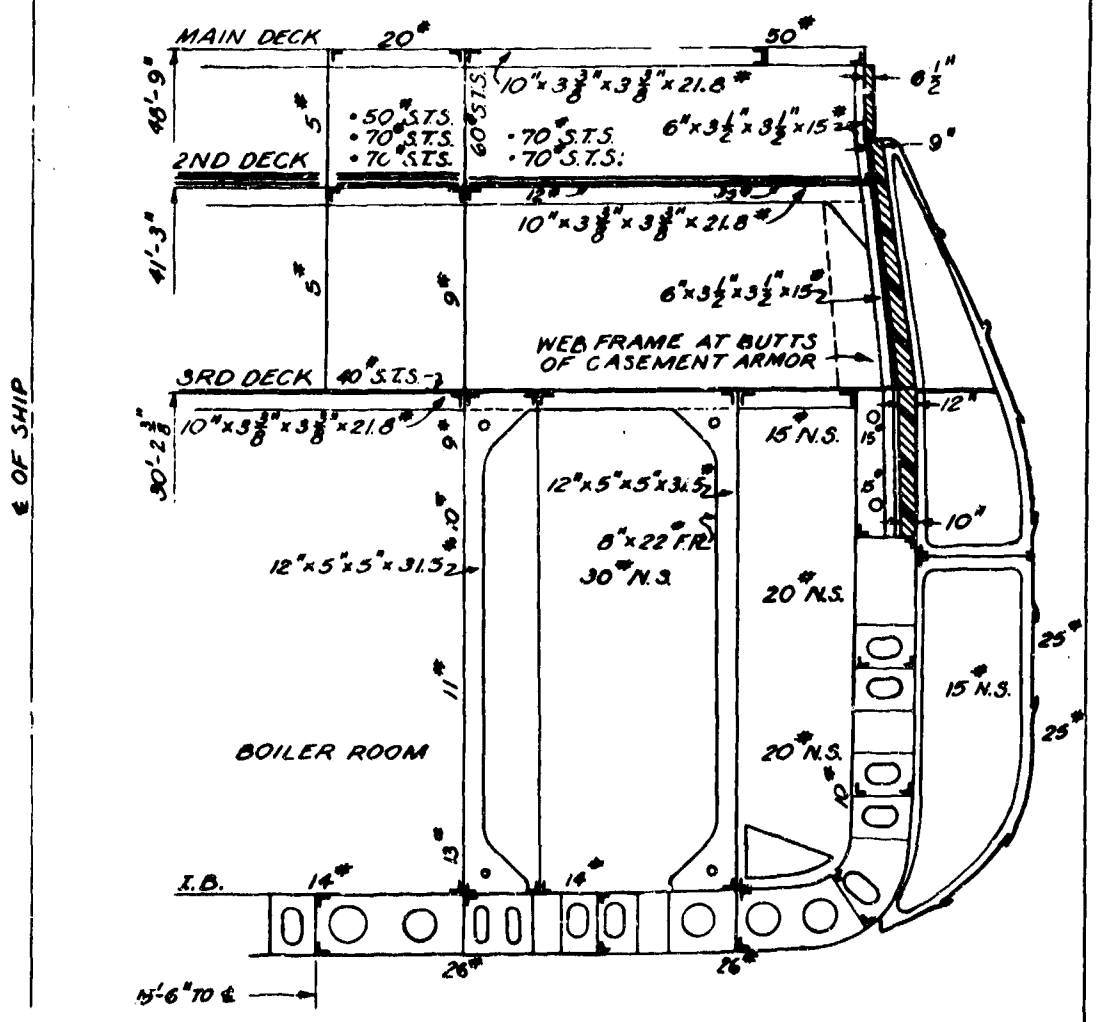
Commissioned: 15 April 1914.

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. 28 feet 0 inches.
Aft. 30 feet 0 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. Mfgd. by Navy Yard, N.Y.
Turbo Generators: Four installed, 400 KW. Mfgd. 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 A

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

There was no flooding, hence no change in drafts or list.

(b) Structural damage.

HULL

Damage is limited to dishing of light structures topside. The bulkheads of the captain's sea cabin are dished about two inches. Light metal doors on two rangefinders are dished. The starboard after flag bag and life net stowage at frame 100 are displaced to the main deck. Minor distortions are evident in light deck lockers and ventilation openings.

MACHINERY

The light metal skirting around the base of the stack was pushed in slightly. The stack itself was not damaged.

ELECTRICAL

Not observed.

(c) Other damage.

HULL

Not observed.

MACHINERY

The casings of boilers 1, 2, and 5 were slightly wrinkled. The casings of boilers 3 and 4 were bulged outward and opened slightly at the joints. There is no other damage to machinery, all of which has been operated since Test A.

ELECTRICAL

Damage to electrical material was confined to minor derangements of searchlights and the burning of a small amount of unimportant cable.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

Heat radiation came from about 150 degrees relative. Paint blistering and scorching is relatively slight and confined to vertical surfaces. White paint is undamaged. Exposed lines and cordage are scorched.

MACHINERY

Paint on the exposed side of deck machinery was scorched and blistered.

ELECTRICAL

Radiant heat emanating fr om the blast, caused slight scorching of paint on some exposed electrical equipment and caused minor scorching of cable.

(b) Fires and Explosions.

HULL

Two minor fires were ignited. Heat radiation caused a

small fire in torn canvas covering the kapok padding on two aircraft recovery sleds stowed on bulkhead 73 at the superstructure deck level. The second fire burned flags in the port flag bags and Army Test Gear on the deck below. The cause of this fire is indeterminat. There were no explosions.

MACHINERY

No evidence.

ELECTRICAL

A fire on the superstructure deck at frame 54 port side burned cable and local boxes on the overhead beneath. A second fire aft of the secondary control station burned a small amount of cable on the tower.

There were no explosions on the ship.

(c) Shock.

HULL

There is no evidence of shock.

MACHINERY

No evidence.

ELECTRICAL

The only evidence of shock found in electrical equipment was the loss of lead chafing pads under the mirror hold down clips on both 36" searchlights, and the breaking of the dome glass and damage to shutter on the port 36" light. The breakage may have been missile damage or pressure damage.

(d) Pressure.

HULL

The air blast originated at a point bearing about 150 degrees relative. Damage is slight and is limited to dishing of light superstructure bulkheads, sheet metal flag bags and lockers, and other light damage. The weather bulkhead around the stack below the skirt is dished on all four sides.

MACHINERY

Blast pressure entered the boilers via the stack and uptakes and caused minor damage to the casings of boilers 3 and 4, and negligible distortion of the casings of boilers 1, 2, and 6.

ELECTRICAL

The breaking of the 36" dome glass, possibly by blast pressure, is the only evidence of pressure found in any electrical equipment.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

A blast pressure of sufficient magnitude to cause any damage at this distance from an explosion is apparently peculiar to the Atom Bomb.

ELECTRICAL

The scorching of cable and paint by radiant heat was the only effect peculiar to the Atom Bomb.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

The casings of boilers 3 and 4 were opened sufficiently to require securing these boilers for repairs. It is estimated that the ship's force could have made repairs to these boilers, to enable them to be steamed, within 2 hours. No other damage has any effect on operation.

ELECTRICAL

None due to electrical damage.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

None due to electrical damage.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None resulting from electrical system failures.

(d) Effect on personnel and habitability.

HULL

The habitability of the vessel is unimpaired as a result of Test A. Some topside personnel would have been injured.

MACHINERY

There might have been a few casualties among personnel of No. 2 fireroom if the ship had been operating at the time of the test. No other casualties would have taken place among personnel below decks. Habitability was not affected.

ELECTRICAL

There was no reduction in habitability, nor would there have been any effect on personnel resulting from electrical damage.

(e) Effect on fighting efficiency.

HULL

Except for some personnel casualties, fighting efficiency would be unaffected.

MACHINERY

The ship's maximum speed would have been reduced to about 18 knots for a few hours.

ELECTRICAL

The very minor electrical damage would not have reduced fighting efficiency.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

Damage is superficial and did not affect the fighting efficiency of the vessel.

MACHINERY

It is not believed that the boilers of a modern battleship would have been affected at the range of the NEW YORK from this form of attack.

ELECTRICAL

Primary bomb damage to electrical equipment on the vessel was negligible. Secondary damage due to fires was minor and would not have occurred if damage control parties had been aboard.

V. Any Preliminary General or Specific Recommendations.

HULL

No comment.

MACHINERY

None.

ELECTRICAL

No recommendations are made.

TECHNICAL INSPECTION REPORT

SECTION I - HULL

GENERAL SUMMARY OF HULL DAMAGE

I. Target Condition After Test.

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

There was no flooding, hence no change in drafts or list.

(b) Structural damage.

Damage is limited to dishing of light structures topside. The bulkheads of the captains sea cabin are dished about two inches. Light metal doors on two rangefinders are dished. The starboard a fter flag bag and life net stowage at frame 100 are displaced to the main deck. Minor distortions are evident in light deck lockers and ventilation openings.

(c) Other damage.

Not observed.

II. Forces Evidenced and Effects Noted.

(a) Heat.

Heat radiation came from about 150° relative. Paint blistering and scorching is relatively slight and confined to vertical surfaces. White paint is undamaged. Exposed lines and cordage are scorched.

(b) Fires and explosions.

Two minor fires were ignited. Heat radiation caused a smal fire in torn canvas covering to kapok padding on two

aircraft recovery sleds stowed on bulkhead 73 at the superstructure deck level. The second fire burned flags in the port flag bags and Army Test Gear on the deck below. The cause of this fire is indeterminate. There were no explosions.

(c) Shock.

There is no evidence of shock.

(d) Pressure.

The air blast originated at a point bearing about 150° relative. Damage is slight and is limited to dishing of light superstructure bulkheads, sheet metal flag bags and lockers, and other light damage. The weather bulkhead around the stack below the skirt is dished on all four sides.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

Not observed.

(b) Effect on gunnery and fire control.

Not observed.

(c) Effect on water-tight integrity and stability.

None.

(d) Effect on personnel and habitability.

The habitability of the vessel is unimpaired as a result of Test A. Some topside personnel would have been injured.

(e) Effect on fighting efficiency.

Except for some personnel casualties, fighting efficiency would be unaffected.

IV. General Summary of Observers' Impressions and Conclusions.

Damage is superficial and did not affect the fighting efficiency of the vessel.

V. Preliminary General or Specific Recommendations of Inspection Group.

No comment.

VI. Instructions for Loading the Vessel Specified the Following:

ITEM	LOADING
Fuel Oil	Minimum
Diesel Oil	Not more than 15 tons
Ammunition	10%
Potable and reserve feed water	Full load
Salt water ballast	2300 tons

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 Ship's Force" issued by the Director of Ships Material. This report is available 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 vessel is excellent. Damage is confined to paint scorching, small fires and dishing of light plating topside. General exterior views taken before and after the test are shown on pages 46 to 53 .

(b) General areas of hull damage.

Damage is confined to the superstructure and weather deck.

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

Damage in the superstructure is caused by heat and air blast generally. Two small fires caused local distortion.

(d) Principal areas of flooding with sources.

There is no flooding.

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

Unimpaired.

B. Superstructure.

(a) Description of damage.

1. Bridge area.

The SG radar pole mast atop the foremast is canted slightly forward and to starboard (photo 91-49 and 1831-9, pages [illegible] and 54). On the navigation bridge, the plexiglass

window in the starboard door is blown inward. The port, starboard and after bulkheads of the captain's sea cabin are dished to a maximum depth of two inches (photo 2048-7, page 55). Ports in these bulkheads are cracked. The starboard rangefinder on the navigating bridge level has had its rear doors dished about two inches. The rear doors on the port rangefinder are dished about eight inches (photo 2048-5, page 56). On the signal bridge level, the port flag bag is distorted as the result of blast and a fire in the flags (photo 2048-1, 8, and 2047-9, pages 57 to 59). The starboard bulkhead of the navigator's sea cabin is dished about two inches.

2. Midship deckhouse and stack.

The incinerator stack has parted at the upper joint (photo 2048-4, page 60). The rectangular uptake inclosure under the stack skirt is dished on all four sides as follows: Starboard bulkhead dished about 11-1/2 inches forward and about two feet aft (photo 2048-10, page 61); forward bulkhead dished about 12 inches (photo 2048-9, page 62); port bulkhead dished about three inches; after bulkhead dished about ten inches. The damage indicates that the blast wave was trapped in the area around the stack so that the velocity head of the wave was converted to a pressure head. Welded joints at corners of half round boundary bars on these bulkheads failed in tension. The F.C. radar array mounted stop the main battery control station just aft of the stack at frame 72 (Photo 154-31; page 48) is broken from its pedestal and has fallen to the superstructure deck at frame 76, port side (photo 50-48 1811-5; pages 9 and 63). The after bulkhead of the tower has sustained minor fire damage as the result of the burning of kapok pads on two stowed aircraft recovery sleds.

3. After deckhouse and tower.

The starboard flag bag and life net stowage atop the clipping shack at frame 100, main deck, was dislocated when light tack welds failed (photo 1810-10, page 64). The lower half of the lens on the forward starboard 36 inch searchlight located on the mainmast is broken.

(b) Causes of damage in each area.

Damage except that attributed to fire, is the result of the action of the air shock wave.

(c) Evidences of fire in the superstructure.

1. Fire consumed the kapok padding on two seaplane recovery sleds which were stowed on bulkhead 73 at the superstructure deck level. The sleds had not been in use for at least one year. Heat evidently penetrated into the canvas through holes and caused ignition.

2. A second fire began in the port flag bag on the signal bridge and spread to Army Quartermaster equipment on the deck below when burning flags fell on the equipment. The flag bag was not covered at the time of the test. Foreign matter in considerable quantity was found in the bottom of the flag bag. These pieces had been highly oxidized and appear to be composed of porous carbon with burned fragments of flags adhering to them. Photographs illustrating the damage to flag bag and deck are 2048-1, 2, 3, 8; 2047-9, 1811-4; pages 57 , 65 , 66 , 58 , 59 , and 67 .

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

In general, plating above 3/8" in thickness is undamaged. Plating below this thickness is dished where exposed as a flat surface normal to the direction of the blast wave. All dished surfaces are flat vertical surfaces. Curved surfaces show definitely superior resistance to deflection.

(e) Constructive criticism of superstructure design or construction.

The superstructure should incorporate curved surfaces in preference to flat surfaces and overhangs and pocketed spaces should be eliminated.

C. Turrets, Guns and Directors.

(a) Protected Mounts.

1. General condition, including operability, if known.

No damage except for a slight scorching of the paint on the outboard starboard and after side (photo 1812-1, page 68). Operability was not affected.

2. Effectiveness of installed turrets or shields.

Excellent.

(b) Unprotected Mounts.

1. General condition, including operability, if known.

No damage except for a slight scorching of the paint on surfaces directly exposed to the blast. Operability was not affected.

2. Effectiveness and sufficiency of crew shelters.

The shields as installed do not provide adequate protection for the crew from heat or blast.

(c) Directors and Rangefinders. (In 14" turrets).

1. General condition, including operability, if known.

No damage. Operability not affected.

2. Condition of instruments therein.

No damage.

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

No comment.

D. Torpedo Mounts, Depth Charge Gear.

Not Applicable.

E. Weather Deck.

(a) General condition of weather deck and causes of damage.

The weather deck has suffered no permanent structural damage. The portion of the main deck aft of Mount 5 was deflect d downward slightly during the test but recovered its original sh e. The deck is not scorched by heat radiation. A fire in Army quartermaster gear stowed for test on the port side of the superstructure deck between frames 56 and 61 resulted in severe damage to the wood decking which was burned completely away. Photo 1811-4, page 67 , shows the remains of the fire. Photos 2048-3 and 2048-2, pages 63 and 65 , show the damage to the deck after the debris was cleared away. A repair party gear locker just forward of the fire is dished about two inches (photo 1811-4, page 67). At various locations on the weather deck, special equipment installed for test has been damaged as shown in photos 1811-3, 11, 12, and 1810-12; pages 69 , 70 , 71 , and 72). Deck deflection scratch gages recorded slight movement of the main deck as shown in the Appendix.

(b) Usability of deck in damaged condition.

Unimpaired.

(c) Condition of equipment and fittings.

1. Mooring and towing fittings.

Undamaged.

2. Boats, boat handling, life rafts.

No boats were aboard. A life net stowage at frame 100, starboard side, has been moved out of its rack and tack welds are broken. (Photo 1810-10, Page 64).

3. Airplane handling gear.

Cranes and catapult are undamaged. Two aircraft recovery sleds burned.

F. Exterior Hull.

No damage other than slight scorching of paint.

G. Interior Compartments (above w.l.).

No damage.

H. Armor Decks and Miscellaneous Armor.

No damage.

I. Interior Compartments (below w.l.).

No damage.

J. Underwater Hull.

No damage.

K. Tanks.

No damage.

L. Flooding.

None.

M. Ventilation.

(a) Damage to ventilation system and causes.

1. Ducts.

The duct leading to the blower of system 111 is slightly distorted as the result of blast entering through improperly closed topside closures.

2. Closures.

The topside closure of system 111 at frame 112, port, is forced shut, shearing anchor bolts and forcing the operating lever against the overhead at frame 111.

3. Effect on habitability.

None.

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

See Item (a) for blast damage.

(c) Evidence that ventilation system allowed progressive flooding.

None.

(d) Constructive criticism.

No comment.

N. Ship Control.

No damage.

O. Fire Control.

(a) Damage to fire control stations and causes.

1. Directors and elevated control positions.

No damage except for moderate dishing of light metal doors.

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

All topside fire control stations do not have adequate protection for the crew from heat or blast.

(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.

Ready service ammunition was not damaged as a direct result of the bomb. 3"/50 ammunition located in ready box on port boat deck was badly overheated by a fire which originally started in signal flag bag above and fell below igniting the deck and army quartermaster material.

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

Satisfactory.

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

None.

(d) Behavior of gasoline stowage facilities.

Satisfactory.

Q. Ammunition Handling.

(a) Condition and operability of ammunition handling devices.

Excellent.

(b) Evidence that any ammunition handling device 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.

No damage.

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.

No data taken by machinery group.

(b) Structural damage.

The light metal skirting around the base of the stack was pushed in slightly. The stack itself was not damaged.

(c) Other damage.

The casings of boilers 1, 2 and 5 were slightly wrinkled. The casings of boilers 3 and 4 were bulged outward and opened slightly at the joints. There is no other damage to machinery, all of which has been operated since Test A.

II. Forces Evidenced and Effects Noted.

(a) Heat.

Paint on the exposed side of deck machinery was scorched and blistered.

(b) Fires and explosions.

No evidence.

(c) Shock.

No evidence.

(d) Pressure.

Blast pressure entered the boilers via the stack and uptakes and caused minor damage to the casings of boilers 3 and 4, and negligible distortion of the casings of boilers 1, 2 and 6.

(e) Effects apparently peculiar to the atom bomb.

A blast pressure of sufficient magnitude to cause any damage at this distance from an explosion is apparently peculiar to the atom bomb.

III. Effects of Damage.

(a) Effect on machinery and ship control.

The casings of boilers 3 and 4 were opened sufficiently to require securing these boilers for repairs. It is estimated that the ship's force could have made repairs to these boilers, to enable them to be steamed, within 2 hours. No other damage has any effect on operation.

(b) Effect on gunnery and fire control.

No comment.

(c) Effect on water-tight integrity and stability.

No comment.

(d) Effect on personnel and habitability.

There might have been a few casualties among personnel of No. 2 fireroom if the ship had been operating at the time of the test. No other casualties would have taken place among personnel below decks. Habitability was not affected.

(e) Total effect on fighting efficiency.

The ship's maximum speed would have been reduced to about 18 knots for a few hours.

IV. General Summary.

It is not believed that the boilers of a modern battleship would have been affected at all at the range of the NEW YORK from this form of attack.

V. Preliminary Recommendations.

None.

DETAILED DESCRIPTION OF MACHINERY DAMAGE

A. General Description of Machinery Damage.

(a) Overall condition.

The casings of boilers 1, 2 and 5 were slightly wrinkled. The casings of boilers 3 and 4 were slightly bulged and opened at the joints. Otherwise, the overall condition of the machinery was not affected by the test.

(b) Areas of major damage.

There is no major damage to machinery. Minor damage occurred to boilers 3 and 4 in #2 fireroom.

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

Damage was caused by blast pressure entering the boilers via the stack and uptakes.

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

Boilers 3 and 4 were made temporarily inoperable. It is estimated that, under emergency conditions, they could have been repaired by the ship's force within 2 hours. Otherwise, the test had no effect on overall operation of machinery. The ship's maximum speed would have been reduced to about 18 knots for a few hours if she had been operating at the time of the test.

B. Boilers.

There is no major damage to the boilers. Minor damage is as follows:

Boiler #1 - inboard casing plate slightly wrinkled.
Boiler #2 - inboard casing plate slightly wrinkled.
Boiler #3 - inboard casing plate bulged outward approximately 6 inches.

Boiler #4 - inboard casing plate slightly bulged.
Boiler #5 - no damage.
Boiler #6 - outboard casing plate slightly wrinkled.

Casing damage to boilers 3 and 4 made them inoperable. They were repaired by the ship's force. All other boilers could have continued steaming at full load. After boilers 3 and 4 were repaired, full boiler power would be available.

All boilers were hydrostatically tested for 12 hours after Test A. No change in the tightness of the boilers is indicated. All boilers were steamed after Test A and functioned normally.

All external fittings, valves and piping connections on all boilers are intact. No sign of leaks or any other indication of failure could be noted while the boilers were being hydrostatically tested and steamed.

The skirting around the base of the stack was slightly bulged in towards the stack. This does not affect operation. There is no damage to the stack.

RESULTS OF HYDROSTATIC TESTS ON BOILER #1

BEFORE AND AFTER TEST A.

TIME	BEFORE TEST	AFTER TEST	TIME	BEFORE TEST	AFTER TEST
0000	368	368	1200	80	89
0030	260	351	1230	75	84
0100	245	318	1300	70	79
0130	230	300	1330	70	75
0200	215	260	1400	68	69
0230	205	245	1430	65	69
0300	195	230	1500	60	67
0330	185	215	1530	57	64
0400	170	205	1600	55	59
0430	160	195	1630	50	56
0500	155	184	1700	50	54
0530	150	170	1730	50	50
0600	145	161	1800	50	50
0630	140	156	1830	50	49
0700	130	149	1900	50	49
0730	125	144	1930	50	48
0800	120	129	2000	50	48
0830	115	124	2030	50	47
0900	110	119	2100	49	46
0930	105	114	2130	49	45
1000	100	109	2200	49	42
1030	95	104	2230	49	40
1100	90	99	2300	49	38
1130	85	94	2330	49	36
			2400	49	32

C. Blowers.

Undamaged. All forced draft blowers were operated under service conditions after Test A, and functioned normally.

D. Fuel Oil Equipment.

Undamaged. The fuel oil equipment was operated under service conditions after Test A. Performance was normal.

E. Boiler Feedwater Equipment.

Undamaged. The feedwater system was used in normal operation after Test A. Performance was normal.

F. Main Propulsion Machinery. (Reciprocating).

Undamaged. The main engines were operated ahead and astern after Test A as follows:

Ahead: about 35 minutes at 30 RPM.
Astern: about 35 minutes at 30 RPM.

The main engines were checked while they were turning over. Performance was normal.

Leads left in two of the bearings of the starboard main engine during Test A indicate some motion of the journals, not exceeding .008 inch. This motion is attributed to the whipping motion of the ship after the blast.

BEARING LEAD DATA

STARBOARD ENGINE - #1 MAIN BEARING - FORWARD INBOARD

No. 1 lead	Before Test A	After Test A	Difference
Port	.0115	.010	.0015
Top	.018	.025	+ .007
Stb'd	.0105	.011	+ .0005
No. 2 lead			
Port	.012	.009	.003
Top	.0185	.016	.0025
Stb'd	.011	.009	.002
No. 3 lead			
Port	.013	.011	.002
Top	.025	.017	.008
Stb'd	.013	.010	.003
No. 4 lead			
Port	.0145	.011	.0035
Top	.025	.020	.005
Stb'd	.012	.011	.001
No. 5 lead			
Port	.015	.012	.003
Top	.022	.023	+ .001
Stb'd	.0135	.013	.0005
No. 6 lead			
Port	.015	.013	.002
Top	.024	.023	.001
Stb'd	.014	.013	.001

STARBOARD ENGINE - #7 MAIN BEARING - FORWARD OUTBOARD

No. 1 lead	Before Test A	After Test A	Difference
Port	.011	.010	.001
Top	.025	.019	.006
Stb'd	.015	.010	.005
No. 2 lead			
Port	.009	.011	+ .002
Top	.016	.017	+ .001
Stb'd	.014	.009	.005
No. 3 lead			
Port	.009	.010	+ .001
Top	.018	.016	.002
Stb'd	.015	.012	.003
No. 4 lead			
Port	.011	.009	.002
Top	.0175	.017	.0005
Stb'd	.013	.011	.002
No. 5 lead			
Port	.009	.010	+ .001
Top	.020	.018	.002
Stb'd	.012	.011	.001
No. 6 lead			
Port	.010	.010	.000
Top	.021	.019	.002
Stb'd	.014	.010	.004

These readings are inconclusive, however, they are indicative that there was some movement of the shaft in the bearing. Maximum movement in bearings was .008.

Discrepancies in readings are marked with a "+" denoting that the lead reading after the test is greater than that before.

G. Reduction Gears.

Not Applicable.

H. Shafting and Bearings.

Undamaged. The main shafting, bearings and bearing foundations were inspected while the main engines were being tested after Test A. There was no sign of misalignment. The duration of the test was 35 minutes and shafts were turned ahead and astern.

I. Lubrication System.

Undamaged. The lube oil systems for both engine rooms were checked during operation of the main engines after Test A. They functioned normally.

J. Condensers and Air Ejectors.

Undamaged. The condensers were operated for 35 minutes after Test A, with a vacuum of 25 inches. Performance was normal.

K. Pumps.

Undamaged. All pumps were operated at normal capacity and load for not less than 30 minutes after Test A. Performance was normal. Motors, reciprocating engines, or turbines driving these pumps were all found satisfactory.

L. Auxiliary Generators (Turbines and Gears).

Undamaged. The four 400 K.W. generator units were operated for several hours at normal capacity after Test A. Performance was normal.

M. Propellers.

Undamaged. The propellers were not accessible for visual inspection. They were checked during operation of the main engines and functioned normally.

N. Distilling Plant.

Undamaged. Both of the 20,000 gallon per day units were placed in service immediately after Test A, and functioned normally.

The emergency distilling plant was operated after Test A. Performance was normal.

O. Refrigeration Plant.

Undamaged. The refrigerating plant was placed in service immediately after Test A, and functioned normally.

P. Winches, Windlasses, and Capstans.

Undamaged. All equipment under this heading was operable under service conditions after Test A, and functioned normally.

Q. Steering Engine.

Undamaged. The steering engine was operated under service conditions after Test A, moving the rudder from full right to full left several times. Performance was normal.

R. Elevators, Ammunition Hoists, etc..

Undamaged. All ammunition hoists were operated after Test A and functioned normally.

S. Ventilation (Machinery).

Undamaged. All of the ventilation machinery was operated after Test A, and functioned normally.

T. Compressed Air Plant.

Undamaged. All air compressors were operated after Test A, and functioned normally.

U. Diesels (Generators and Boats).

Undamaged. The two emergency diesel generators were operated under service conditions after Test A, and functioned normally.

No power boats were aboard during the test.

V. Piping Systems.

Undamaged. The two atmospheric exhaust pipes running up alongside the stack were slightly dented by blast pressure. This does not affect operation.

All piping has been tested at normal operating pressures since Test A, and functions normally.

W. Miscellaneous.

Undamaged. Ship's galley, laundry, tailor shop, and machine shop equipment has all been tested and operated satisfactorily.

TECHNICAL INSPECTION REPORT

SECTION III - ELECTRICAL

GENERAL SUMMARY OF ELECTRICAL DAMAGE

I. Target Condition After Test.

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

Not observed.

(b) Structural damage.

Not observed.

(c) Other damage.

Damage to electrical material was confined to minor derangements of searchlights and the burning of a small amount of unimportant cable.

II. Forces Evidenced and Effects Noted.

(a) Heat.

Radiant heat emanating from the blast, caused slight scorching of paint on some exposed electrical equipment; and caused minor scorching of cable.

(b) Fires and explosions.

A fire on the superstructure deck at frame 54 port side burned cable and local boxes on the overhead beneath. A second fire aft of the secondary control station burned a small amount of cable on the tower.

There were no explosions on the ship.

(c) Shock.

The only evidence of shock found in electrical equipment was the loss of lead chafing pads under the mirror hold down clips on both 36" searchlights, and the breaking of the dome glass and damage to shutter on the port 36" light. The breakage may have been missile damage or pressure damage.

(d) Pressure.

The breaking of the 36" dome glass, possibly by blast pressure, is the only evidence of pressure found in any electrical equipment.

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

The scorching of cable and paint by radiant heat was the only effect peculiar to the atom bomb.

III. Results of Test on Target.

(a) Effect on propulsion and ship control.

None due to electrical damage.

(b) Effect on gunnery and fire control.

None due to electrical damage.

(c) Effect on water-tight integrity and stability.

None resulting from electrical system failures.

(d) Effect on personnel and habitability.

There was no reduction in habitability, nor would there have been any effect on personnel resulting from electrical damage.

(e) Total effect on fighting efficiency.

The very minor electrical damage would not have reduced fighting efficiency.

IV. General Summary of Observers' Impressions and Conclusions.

Primary bomb damage to electrical equipment on the vessel was negligible. Secondary damage due to fires was minor and would not have occurred if damage control parties had been aboard.

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

No recommendations are made.

DETAILED DESCRIPTION OF ELECTRICAL DAMAGE

A. General Description of Electrical Damage.

(a) Overall condition.

The overall condition of the ship's electrical equipment was almost unchanged by the blast.

(b) Areas of major damage.

There was no major damage.

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

There was no major damage. Minor damage was caused by fires and blast or missiles.

(d) Operability of electric plant.

1. Ship's service generator plant - not affected.

2. Engine and boiler auxiliaries - not affected.

3. There is no electric propulsion on the vessel.

4. Communications - not affected.

5. Fire control circuits - not affected.

6. Ventilation - not affected.

7. Lighting - minor fire damage to local lighting leads at one location.

(e) Types of equipment most affected.

Minor shock effects on searchlights and minor burning of cable is the extent of the blast damage.

B. Electric Propulsion Equipment.

This item does not apply to the vessel.

C. Electric Propulsion Control Equipment.

This item does not apply to the vessel.

D. Ship's Service Generators.

The ship's service generators were tested by the ship's force and were all operated to supply normal ship's electrical load. No damage to the machines was revealed by the operation nor by staff inspection.

E. Emergency Generators.

Each of the two diesel emergency generators were given visual inspection and then operated to supply ship's power upon return of the ship's force to the vessel after the "A" test. No damage to either machine was found.

F. Switchboards and Distribution Panels.

All of the ship's service switchboards and distribution panels were inspected and given insulation resistance tests after the "A" test. No damage was found. All circuits from the boards tested for insulation resistance satisfactorily.

G. Wiring, Wiring Equipment and Wireways.

1. Negligible damage to wiring and equipment occurred as a result of Test A.

2. The only direct blast effect on cable was the slight charring of the sheath of a rubber portable cable coiled on the starboard side of No. 3 turret. The cable remained serviceable. Local lighting cables under the overhead at main deck, port, frames 56 to 58, exuded through armor and charred badly due to the heat coming from

burning Army supplies on the deck above. None of the burned leads were grounded by the damage but none were satisfactory for further regular service.

3. A water-tight aluminum snap switch located with the damaged cables at frame 57 was also heated by the fire above but functioned after the return of the ship's force following the test. It failed by an internal short after several days and the resulting arc damage made the actual heat damage uncertain.

4. An armored cable connected to an M.C. speaker on the after side of the after secondary battery control tower was heated sufficiently by a fire to cause exuding and burning of the sheath. The cable remained usable.

5. On the after side of the captain's sea cabin which was bulged inward slightly by the blast; one cable, strapped to the bulkhead broke off cleanly at the kick-pipe, and a second cable pulled out of the pipe one half-inch because of the shifting of the bulkhead.

H. Transformers.

There are no ship's service transformers on the vessel. Small ordnance, I.C. and F.C. transformers are all well protected and suffered no damage.

I. Submarine Propelling Batteries.

This item does not apply to the vessel.

J. Portable Batteries.

Inspection showed no breakage, acid spillage, or opening of seals on any portable battery on the ship.

K. Motors, Motor-Generator Sets and Motor Controllers.

All motors, motor-generators and motor controllers were inspected and operated by the ship's force. No damage due to the blast was found.

L. Lighting Equipment.

All lighting equipment was operable after the test. No fixtures or lamps were broken or damaged by the test.

M. Searchlights.

1. Both 36" searchlights aft were trained forward at zero elevation at the time of the blast. The only damage sustained by the port light was the dislodging of the upper four lead chafing pads, installed between the mirror and the hold down clips.

2. The starboard 36" light had the front door glass broken, possibly by a missile. All of the mirror chafing pads were knocked free. Two blades of the iris shutter were bent, permitting light leakage; but could have been quickly repaired and did not interfere with shutter operation.

3. Two 12" signal searchlights on the same platform as the 36" lights, two 12" searchlights on signal bridge and two 24" signal searchlights on the flag bridge, frame 48, were undamaged except for scorching of paint on the blast side of the forward light.

N. Degaussing Equipment.

1. The motor-generators, controls and meters of the four coil degaussing system showed no damage on inspection. Insulation test readings on all coils were consistent with previous readings. The system operated satisfactorily on test.

2. Compass compensating coils; type "B" mounted on the steering compass and the standard compass on the navigation bridge at frame 57, were not damaged. The paint on the coils for the standard compass was scorched slightly. The Magnesyn compass transmitter above the after searchlight platform together with its compensating coil set, was not damaged.

O. Gyro Compass Equipment.

Both of the Arma Mk VIII Mod 3A gyro compasses showed no damage on inspection. Both operated properly, settling out on the meridan satisfactorily. Gyro repeaters and associated equipment operated normally and had no visible damage.

P. Sound Powered Telephones.

No sound powered telephones were damaged by the blast. Representative hand and head-sets in areas exposed to the blast tested satisfactorily.

Q. Ship's Service Telephones.

The ship's service telephone switchboard and the sets throughout the ship showed no damage and all units worked properly in service after the blast.

A hand-set in the captain's cabin was carried in two inches by the bulging of its mounting bulkhead but was not damaged. There was no indication of any shock on the set.

R. Announcing Systems.

All speaker units on the ship functioned after the test. One RCA class H-M speaker on the after side of the after secondary battery control was exposed to a fire below it. There was no visible damage except for blackening of paint, and the speaker worked properly.

All amplifiers and inter-communication units were undamaged.

S. Telegraphs.

All telegraph systems worked properly on test. A visual inspection revealed no damage to any unit.

T. Indicating Systems.

Inspection of the vessel's indicating systems revealed no damage.

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

The I.C. and A.C.O. switchboards were inspected and given insulation tests. No damage was found by test nor by normal operation.

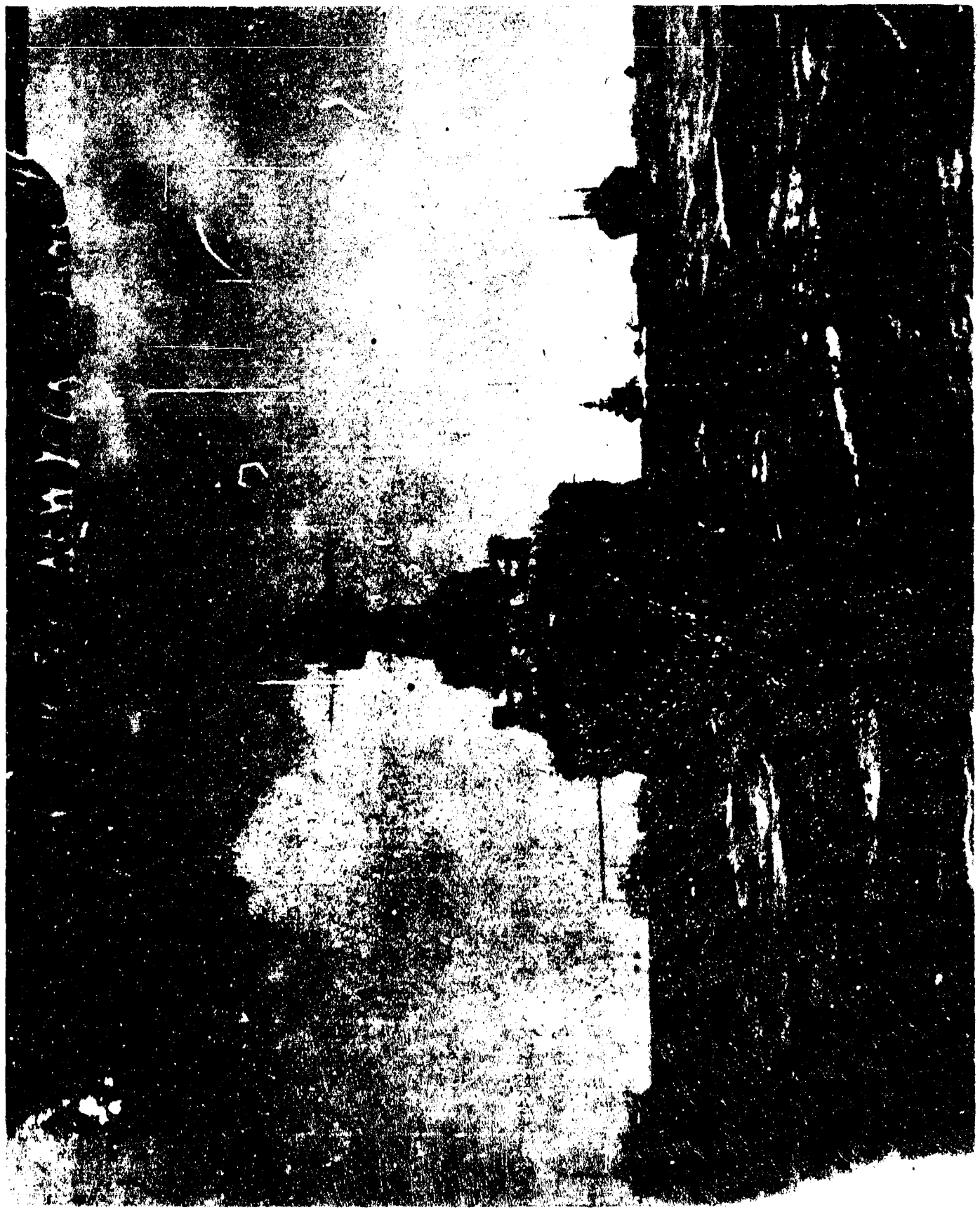
V. F.C. Switchboards.

The F.C. switchboards were inspected and given insulation tests and then operated normally. No damage was found.

SECTION IV

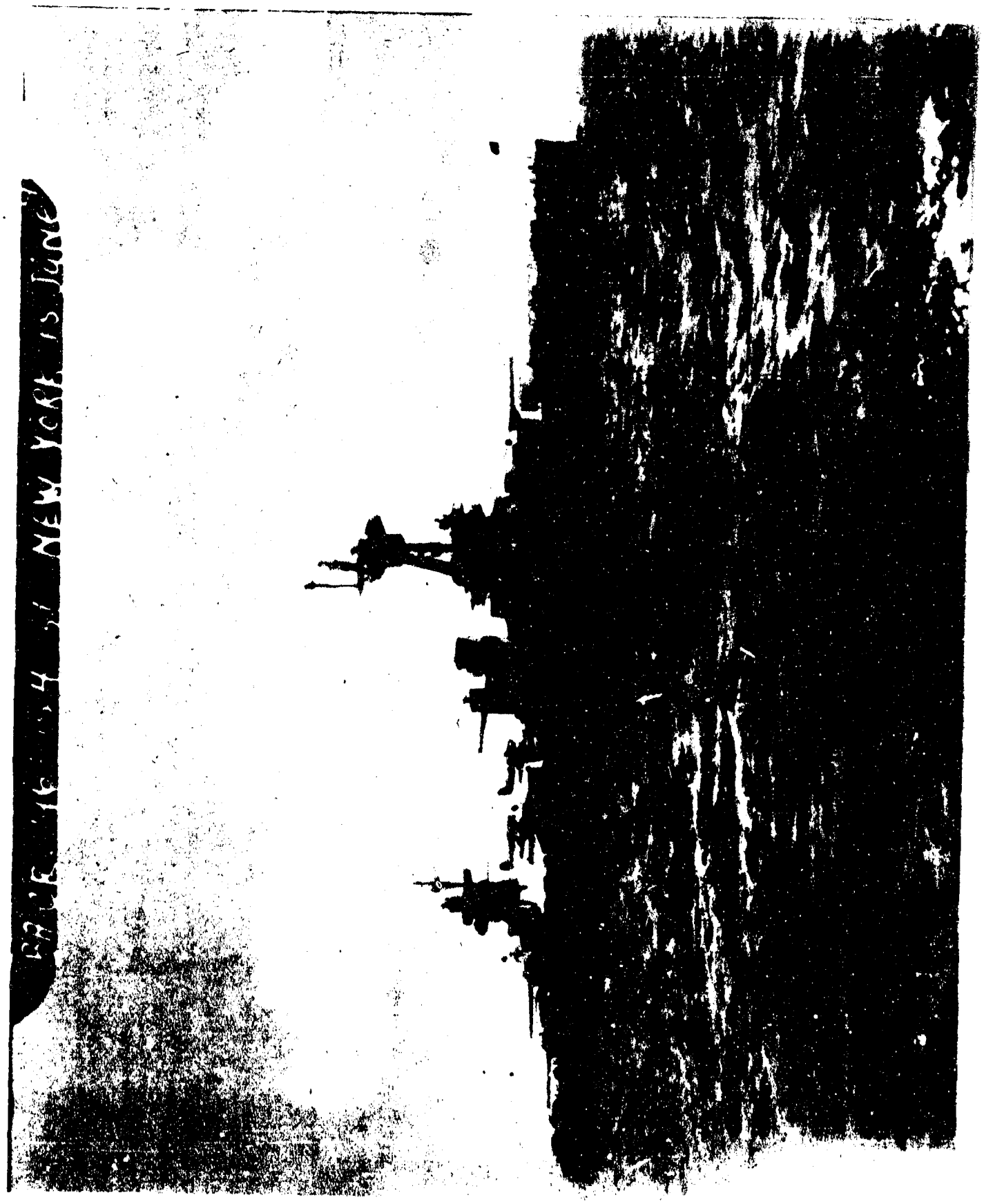
PHOTOGRAPHS

TEST ABLE

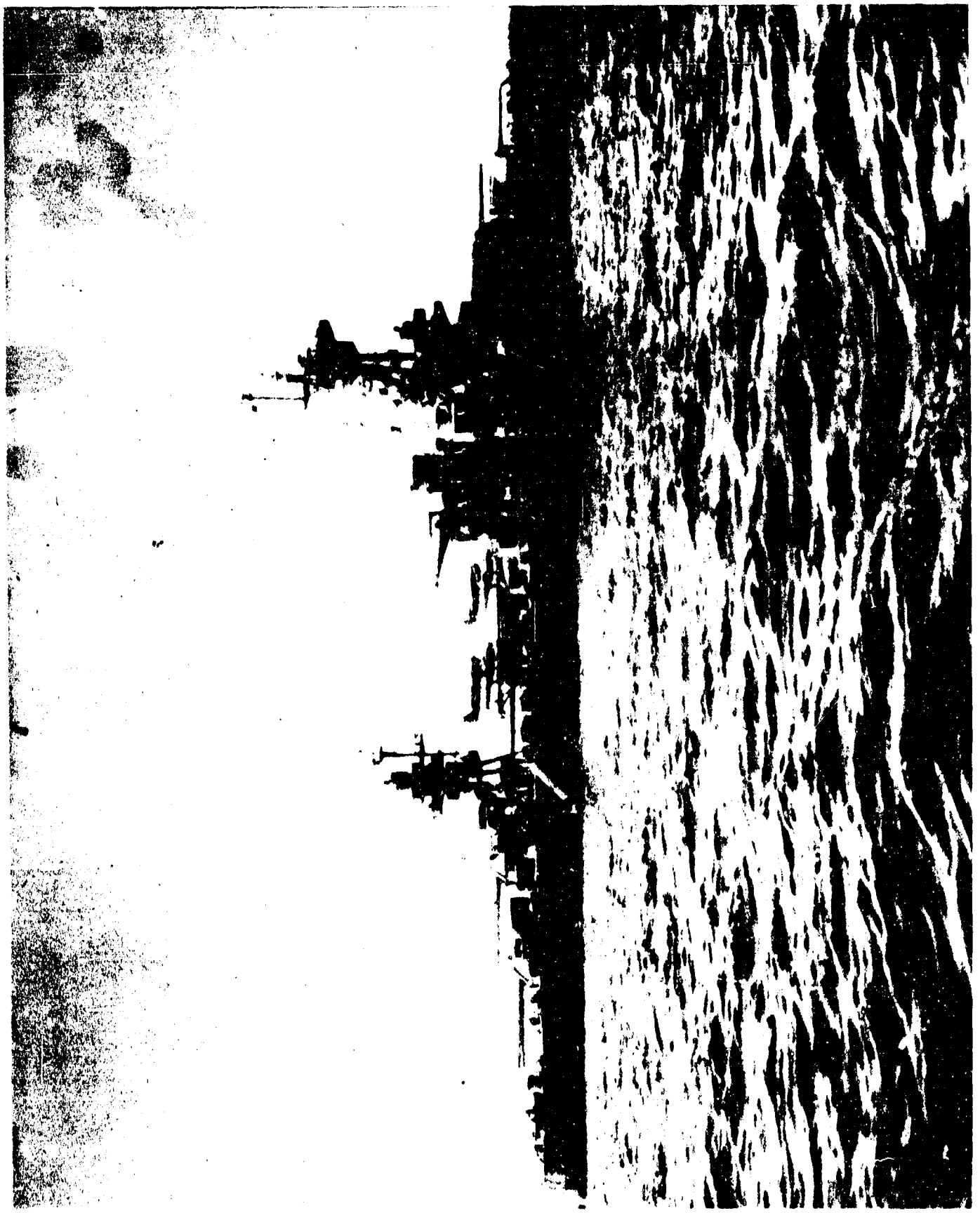


BA-CR-196-154-29. View from dead ahead before Test A.

AA-CR-227-50-50. View from dead ahead after Test A.

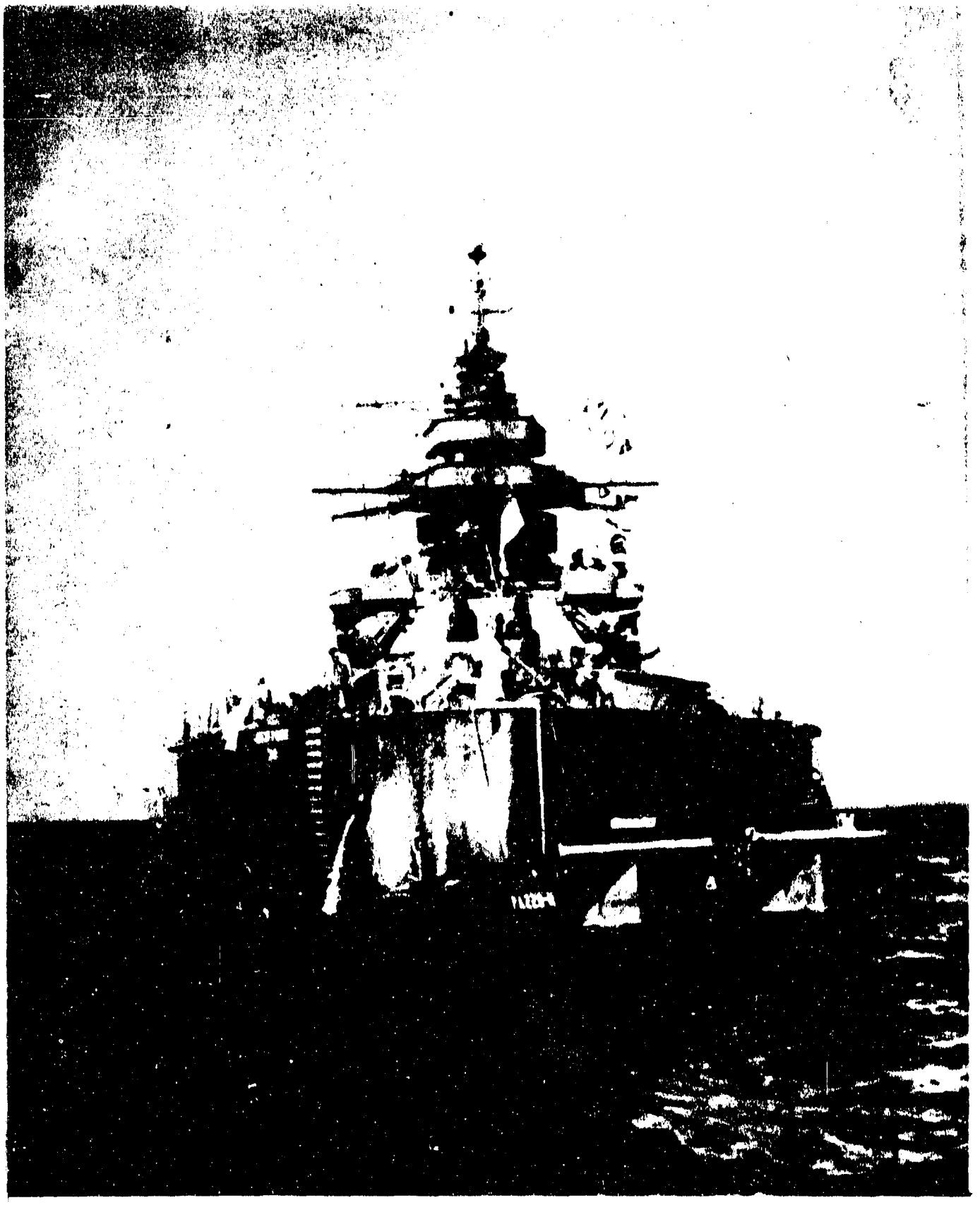


BA-CR-196-154-31. View on starboard beam before Test A.



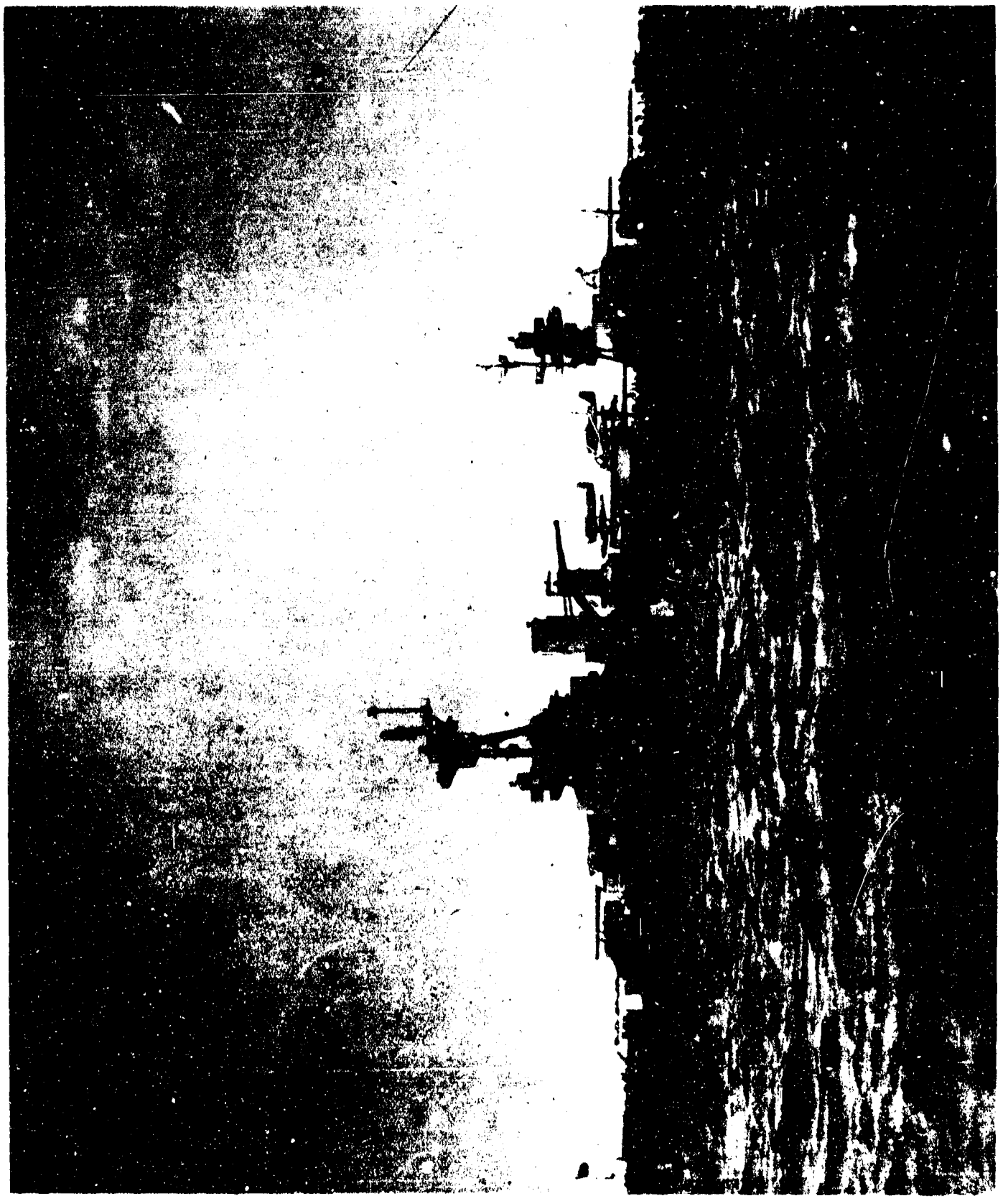
AA-CR-227-50-48. View on starboard beam after Test A.

BA-CR-196-154-33. View from dead astern before Test A.



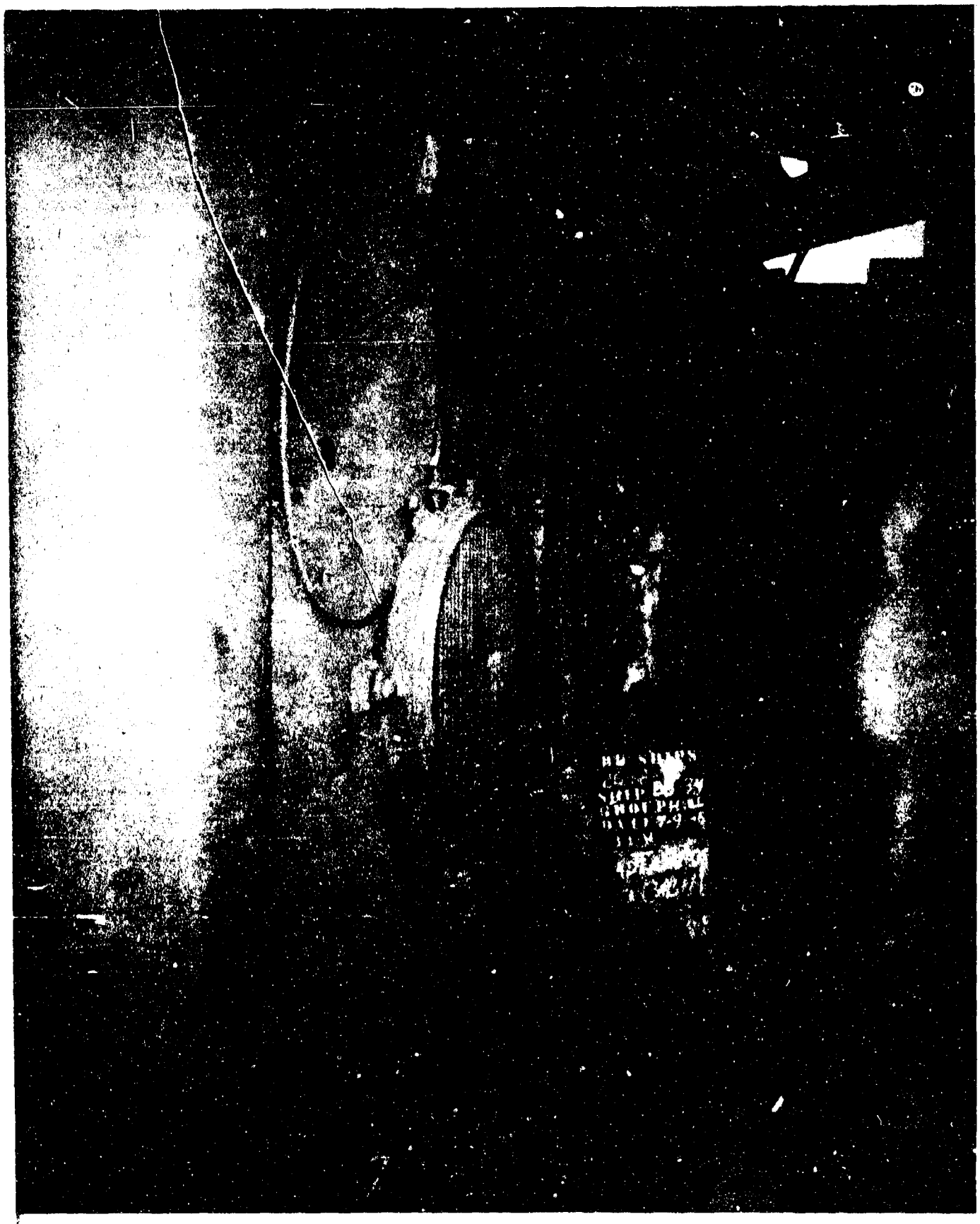
AA-CR-227-50-54. View from dead astern after Test A.

BA-CR-196-154-27. View on port beam before Test A.

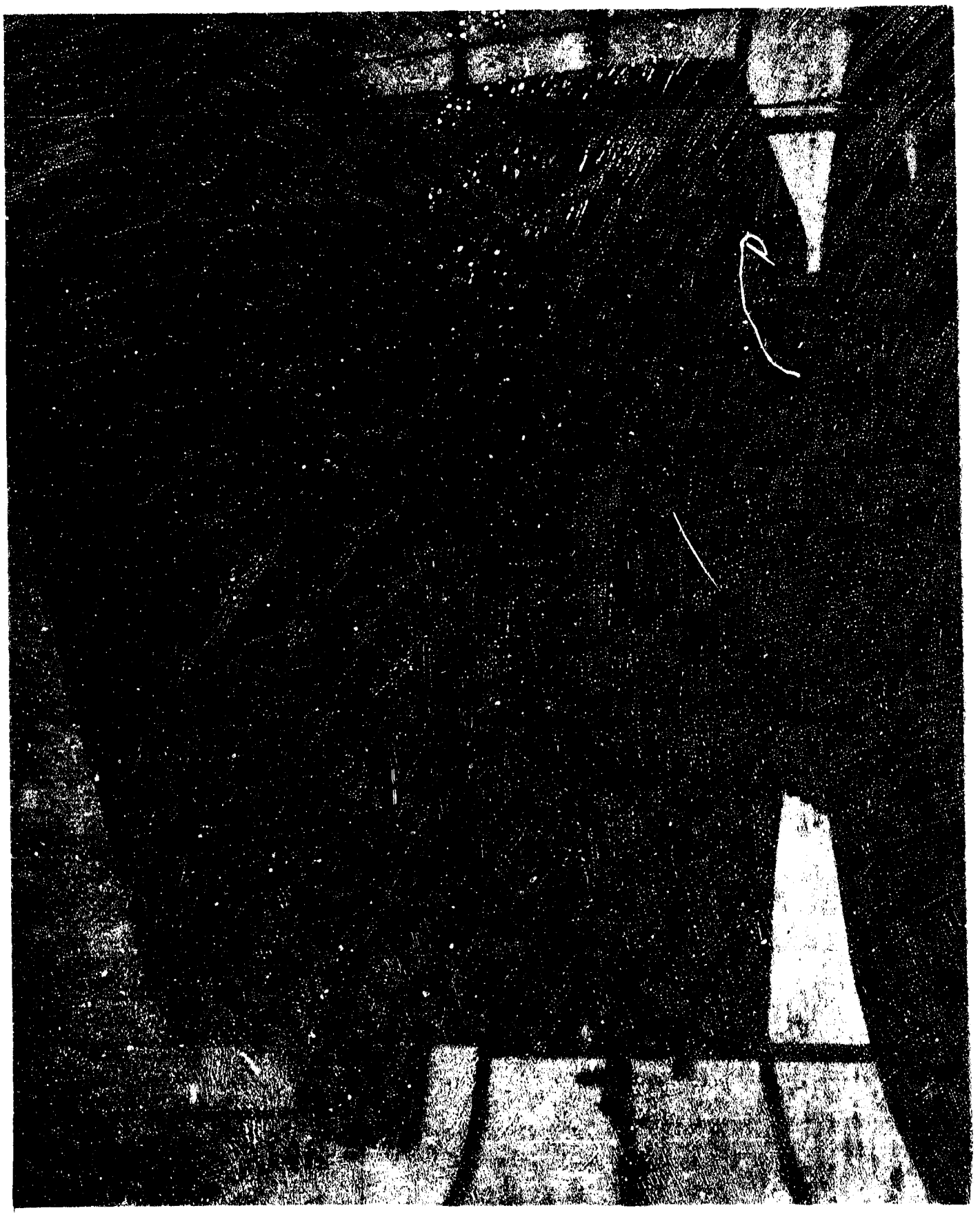


AA-CR-227-91-49. View on port beam after Test A.

AA-CR-62-1831-9. Close-up of forward superstructure, port side.

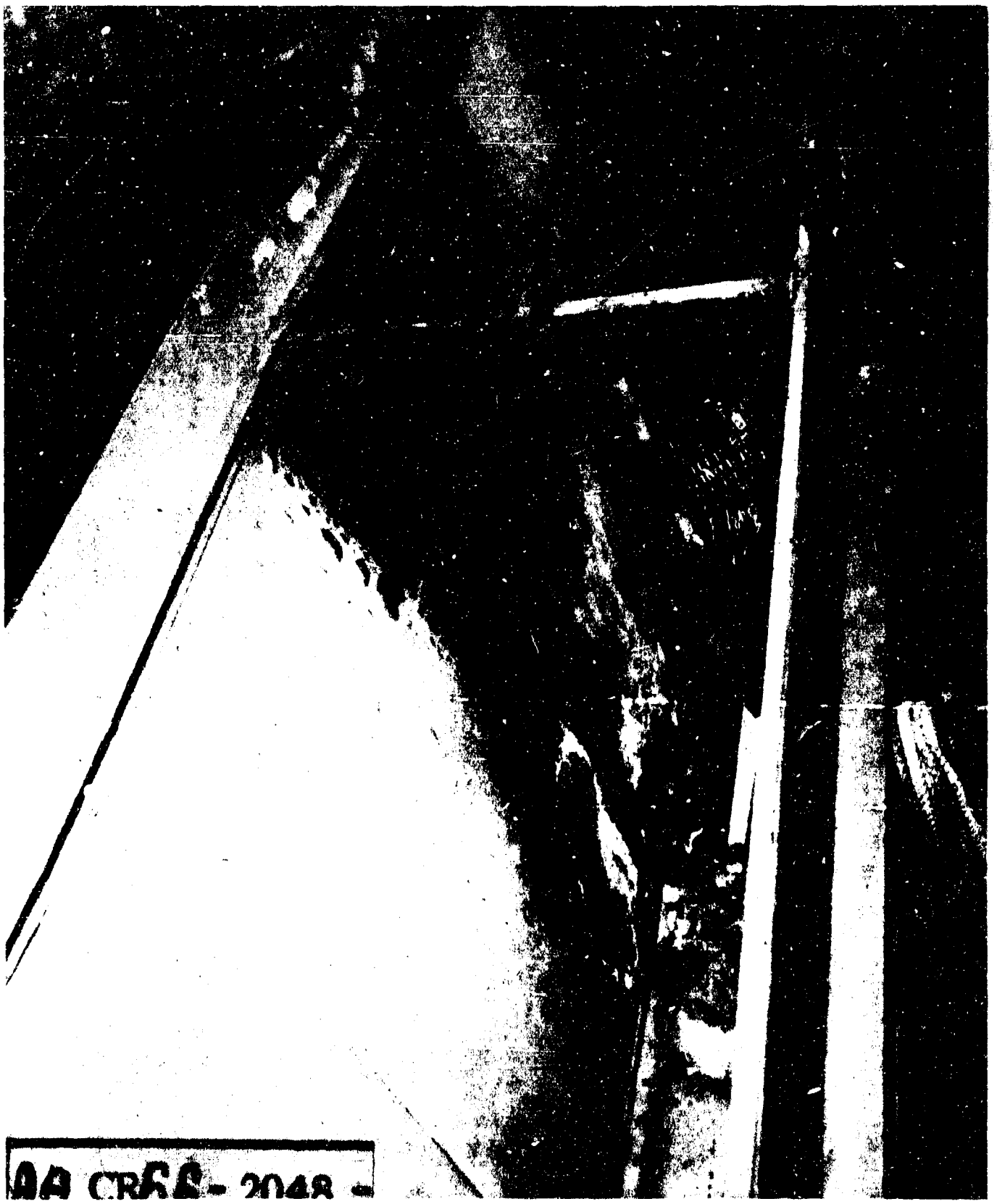


AA-CR-66-2048-7. Deflection of after bulkhead of captain's sea cabin on navigating bridge level.



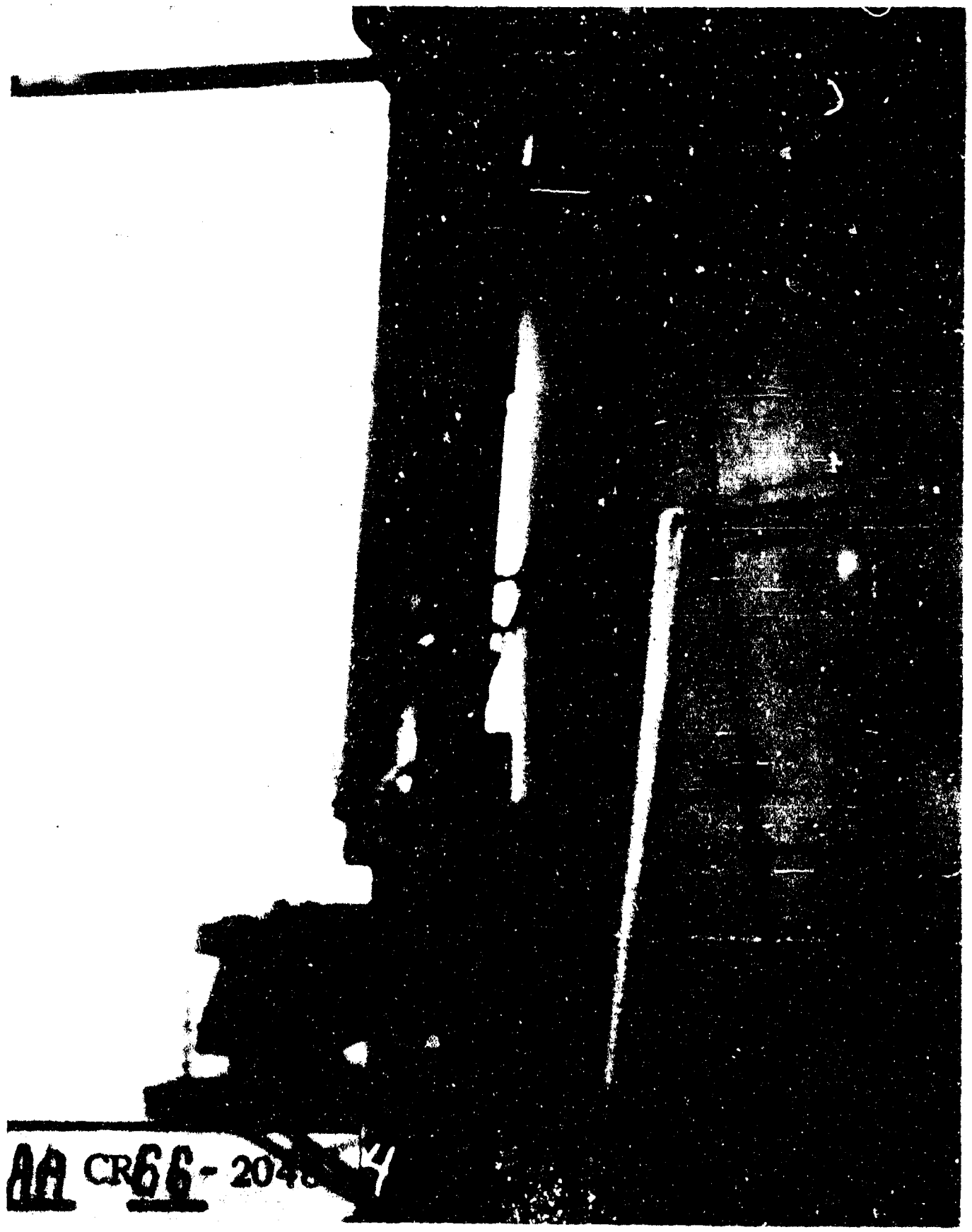
AA-CR-66-2048-5. Range-finder booth on port side of navigating bridge level at frame 57, showing damage to rear doors.

AA-CR-66-2048-1. Port flag bag, showing heat and blast damage.

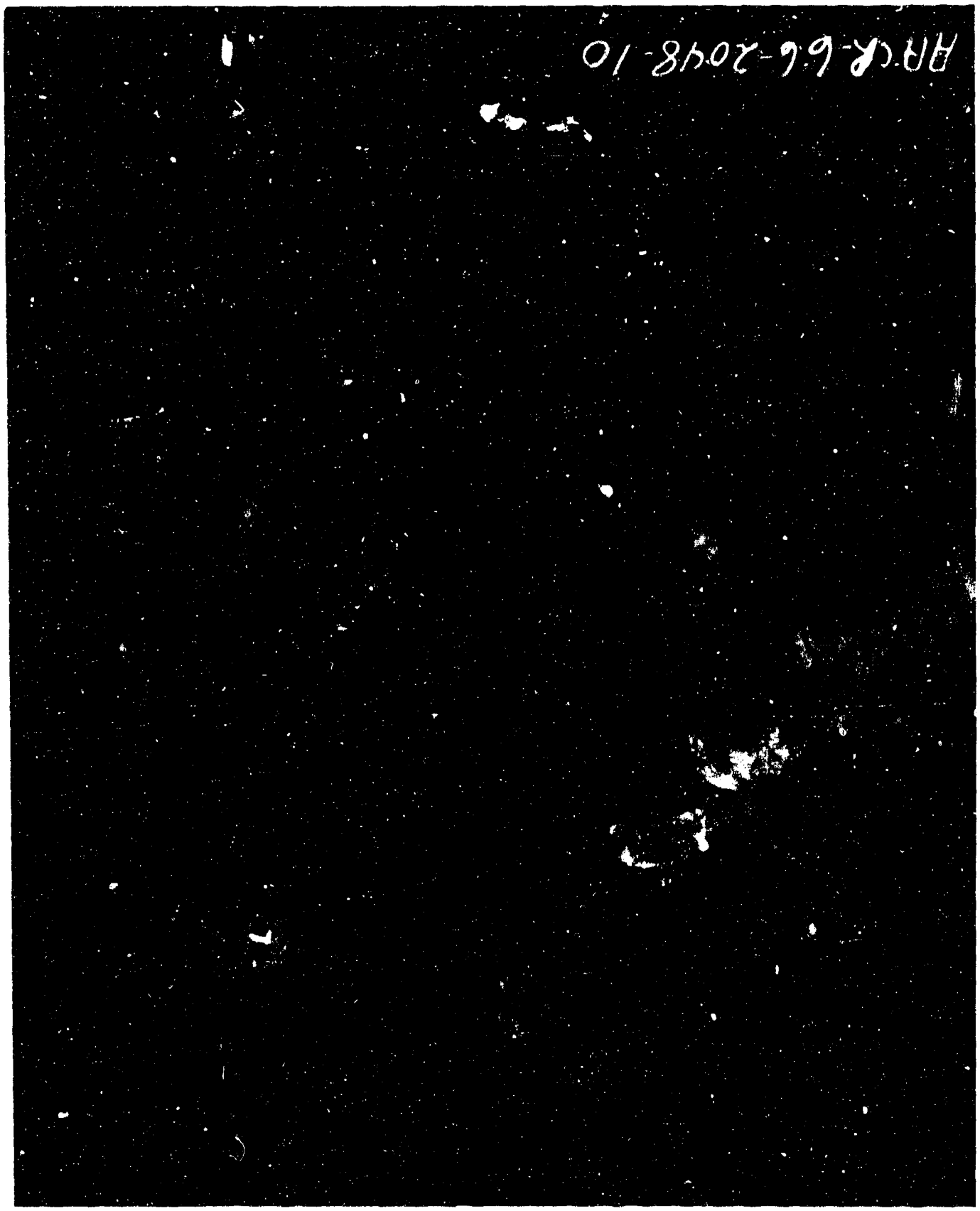


AA-CR-66-2048-8. Interior of port flag bag, showing fire damage.

AA-CR-66-2047-9. Port flag bag, looking forward and inboard.

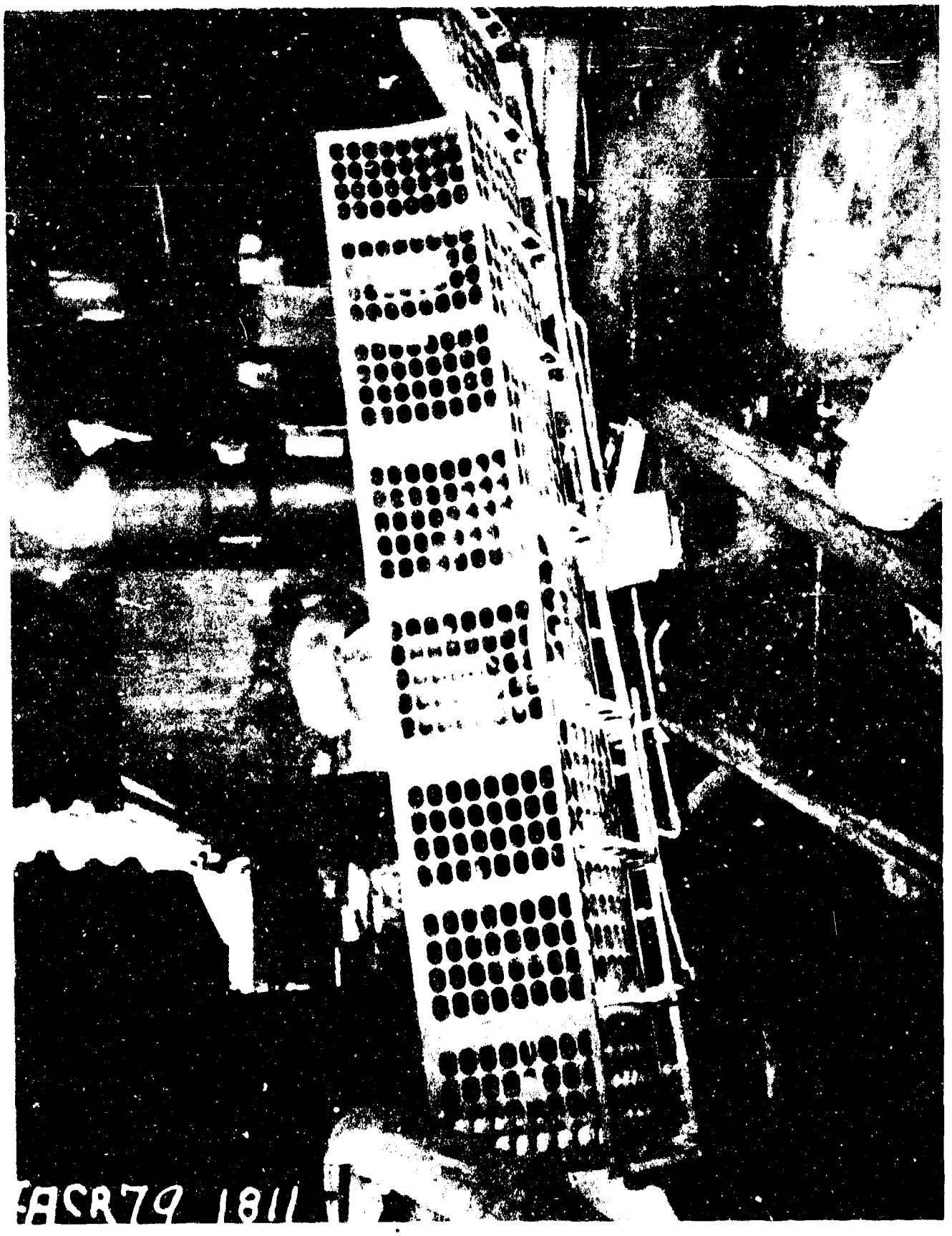


AA-CR-66-2048-4. Broken incinerator smokepipe, port side of stack.

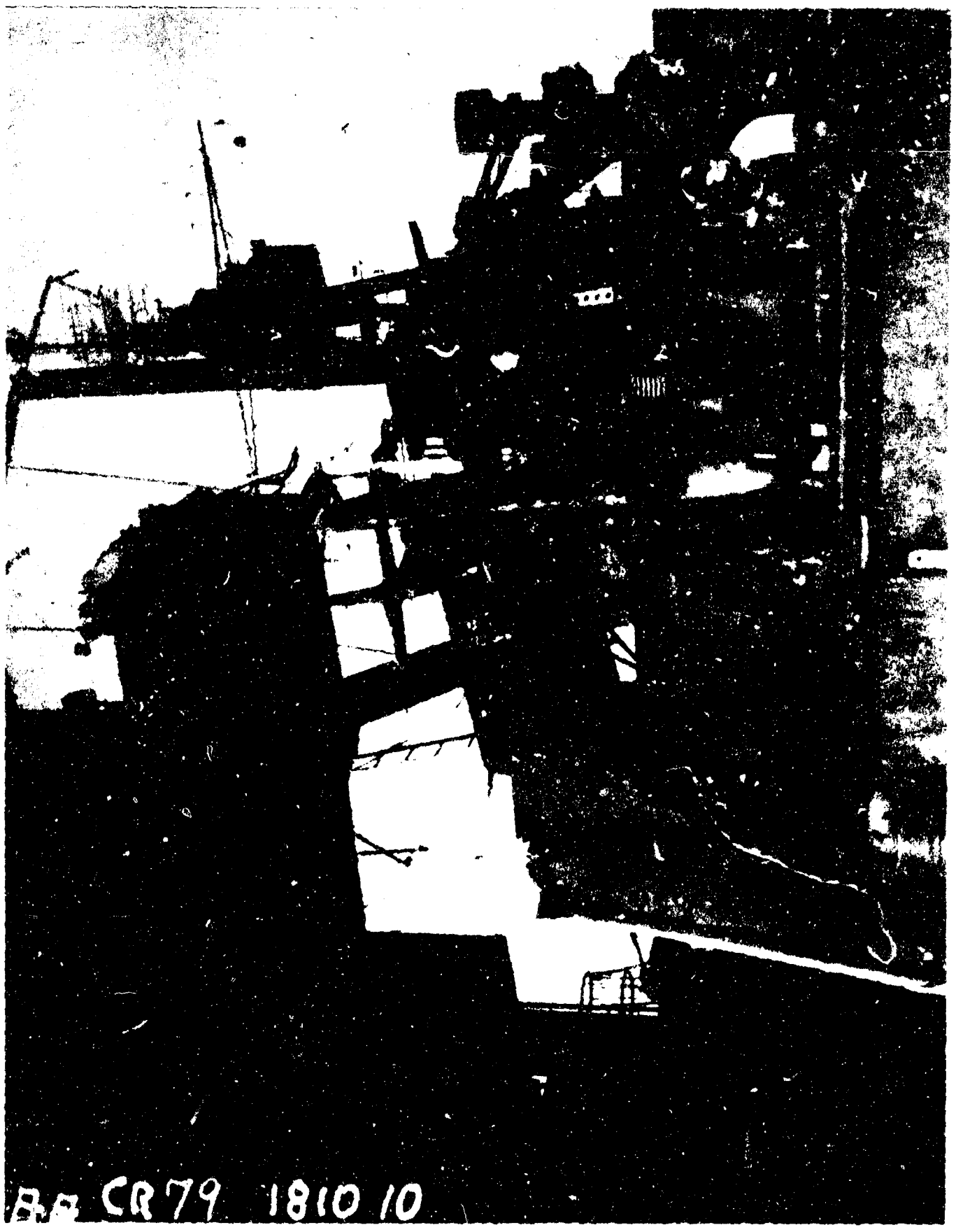


AA-CR-66-2048-10. Starboard bulkhead of uptake enclosure, showing blast damage.

AA-CR-66-2048-9. Forward bulkhead of uptake enclosure, showing blast damage.

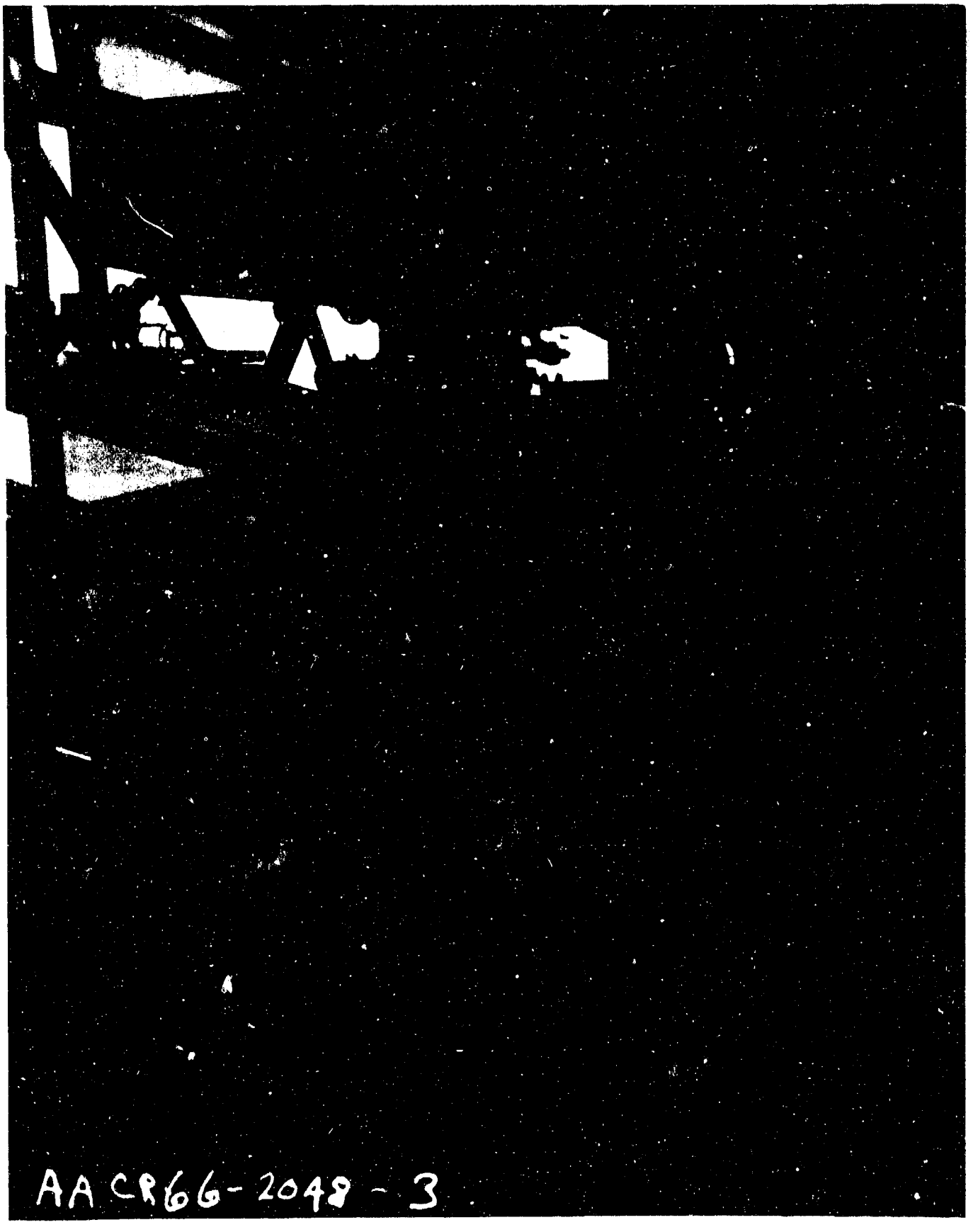


AA-CR-79-1811-5. Looking forward on port side of superstructure deck level from frame 76 showing radar array from top of main battery control station fallen at frame 72.



AA-CR-79-1810-10. Looking forward on main deck, starboard side, from about frame 115, showing condition of superstructure.

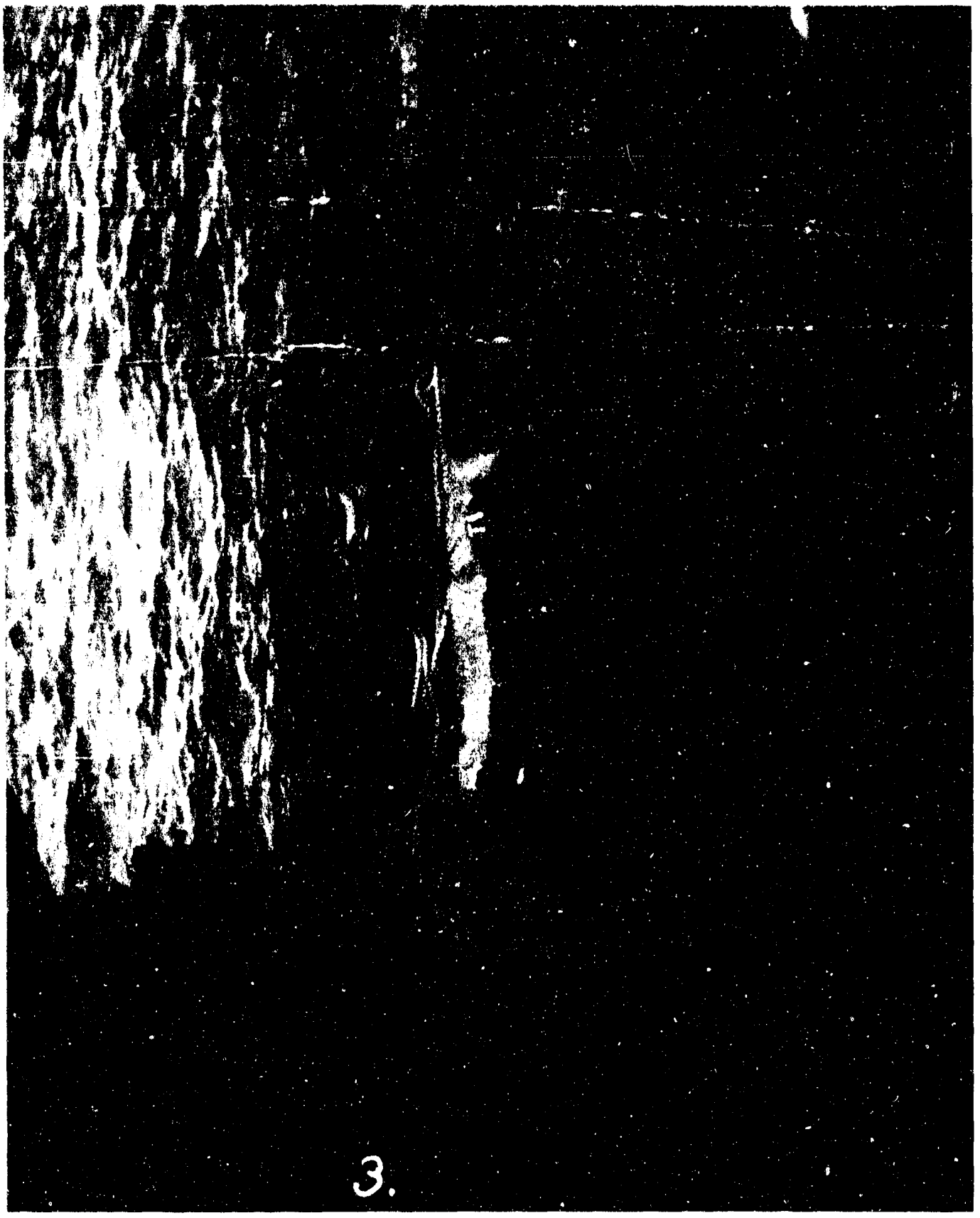
AA-CR-66-2048-2. Looking inboard at frame 56 on superstructure deck, port side, showing fire damage to wood deck. See photo No. 2048-3.



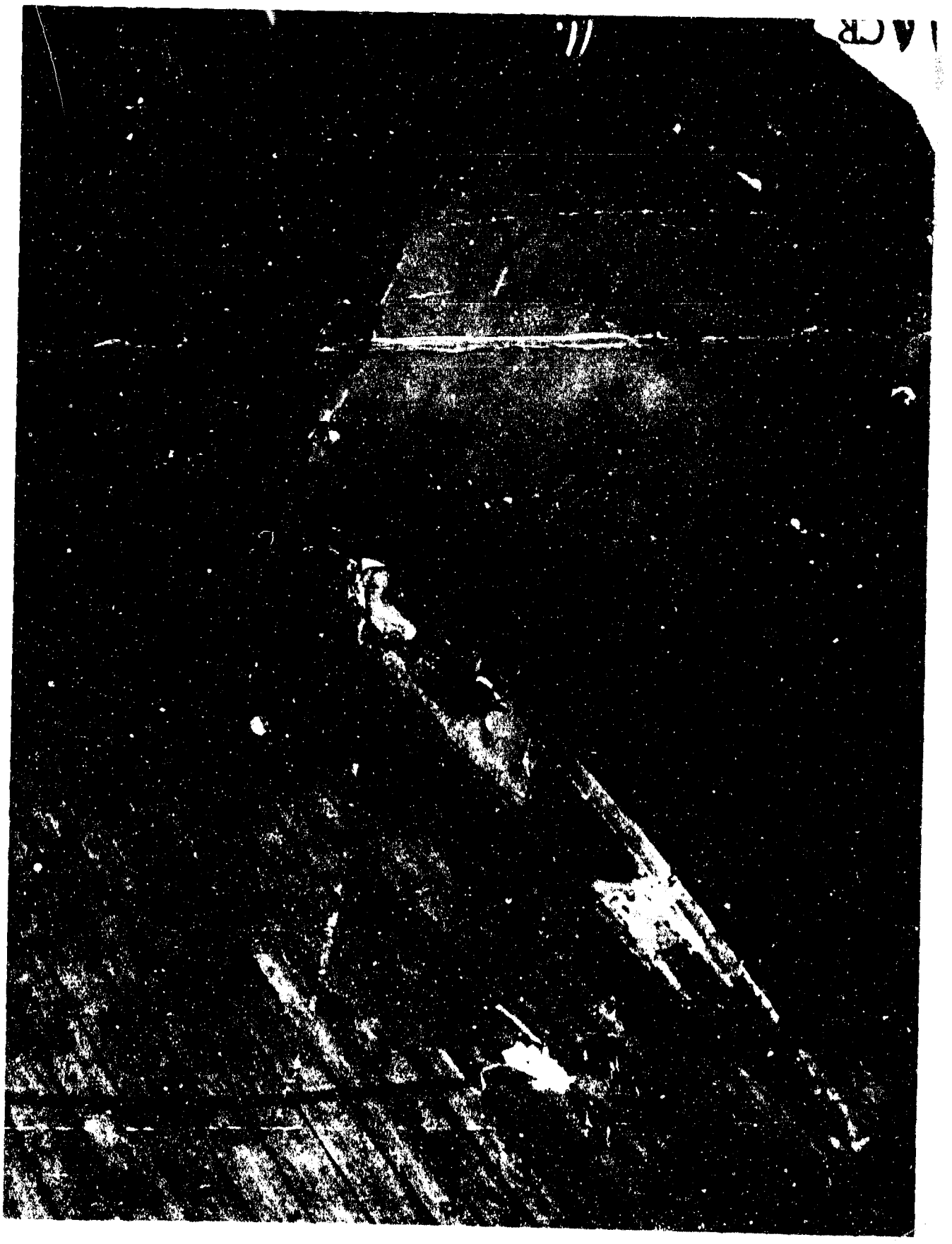
AA-CR-66-2048-3. Fire damage to wooden deck on port side of superstructure deck, frames 56 to 61, after clearing debris. See photo No. 1811-4.

AA-CR-79-1811-4. Fire damage on port side of superstructure deck, frames 56 to 61, resulting from burned army equipment.

AA-CR-79-1812-1. Heat damage on face plate of aftermast turret.



AA-CR-79-1811-3. Fragment of aircraft wing lying in starboard waterway, main deck, frame 66.



AA-CR-79-1811-11. Test airplane wing section damaged by blast.

AA-CR-79-1811-12. Test mirrors wrecked by blast, main deck, port side about frame 115.

AA-CR-79-1810-12. Blast damage to test aircraft wing section, main deck, starboard side about frame 96.

APPENDIX

SHIPS MEASUREMENT DIAGRAM

TEST ABLE

APPENDIX

SHIP MEASUREMENT DATA

Deck Deflection Scratch Gages.

Six gages were installed to record relative movement between the second and main decks. Gage locations and readings are tabulated on page 75 .

DECK DEFLECTION GAGES

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

LOCATION			MAXIMUM	MAXIMUM	PERMANENT SET		REMARKS
FR. NO.	DECK	DIST. OFF ℄	COMP.	EXP.	DISTANCE	EXP. / COMP.	
10	2ND	PORT	0-0-1/16	0-0-1/16	0-0-1/16	EXP.	NONE
39	"	STBD.	0-0-1/16	0-0-1/16	0-0-1/16	EXP.	"
39	"	PORT	NONE	NONE	NONE	NONE	NONE
85	"	PORT	0-0-3/8	0-0-1/8	0-0-1/16	EXP.	"
108	"	STBD.	NONE	NONE	NONE	NONE	"
123	"	CENTER L.	0-0-9/16	0-0-1/8	"	"	"

APPENDIX

COMMANDING OFFICER'S REPORT

TEST ABLE

REPORT #11

COMMANDING OFFICERS REPORT

SECTION I

1. U.S.S. NEW YORK (BB34) was anchored in Berth 188, Bikini Lagoon, 975 yards 281° true from the center of the target array, with 105 fathoms of chain to the riding anchor, starboard, and 35 fathoms to the underfoot anchor. Blast direction was 150°-165 relative.

2. The ship was in material condition ZEBRA and in addition all "W" fittings were closed. All machinery and equipment in the ship was operable at the time of the test. Liquid loading was in accordance with reference (b).

3. The only effect of special material on the ship's ability to resist damage was that occasioned by the presence on the boat deck of inflammable Army Quartermaster stores. None of these items would have jeopardized the ship's effectiveness if fire fighting personnel had been aboard.

SECTION II

1. General Summary of Damage.

(a) Hull.

(1) The overall condition of hull structure subsequent to the test is excellent. Paint was scorched from slight to moderate degree, in general aft of the foremast structure and to starboard of the center line. Side plating of Captain's emergency cabin and the uptake shield at base of stack were moderately dished. Other damage was of small extent and negligible. Two small fires were started (see Enc A) but burned themselves out without secondary damage to the ship. There was no flooding and residual strength, buoyancy and operability were unaffected.

(b) Engineering.

(1) Lower casing panels, inboard and outboard, boilers nos. 1 and 2, were buckled but not blown off. Inboard lower casing panels, boilers nos. 3 and 4 were blown off. Outboard lower panel casing, boiler no. 5, and outboard upper casing, boiler no. 6, were buckled but not blown off.

(2) This damage was caused by transmission of pressure down the stack and it was the only damage to machinery installation or equipment.

(3) Pressure gauges installed by DSM personnel in no. 1 fireroom indicated the maximum blast pressure to have been less than one (1) lb/sq. in. It seems likely that the internal casing pressure in all boilers built up more rapidly than did the pressure in the boiler rooms, since in the case of the former the pressure was transmitted through the relatively large stack opening whereas blast pressure in the firerooms was wiredrawn through intakes and register shutters. However, it is believed that the excess casing pressure was of no great magnitude, inasmuch as a small

pressure differential would suffice to dislodge the casing panels from their insecure fastenings. Since, on four boilers, casing panels were not blown off, it is likely that in boilers 3 and 4 the fireroom pressure normally carried would have prevented the casualty and minimized the possibility of serious flarebacks.

(4) The damage would not have prevented the ship from remaining in action but the casualties to nos. 3 and 4 boilers would probably have resulted in reduction of the maximum speed normally obtainable by about three (3) knots.

(c) Gunnery.

(1) The Mark III fire control radar atop the after fire control tower amidships was blown from its turntable to the boat deck as a result of weakness of its supporting arms.

The antenna was undamaged and could be replaced and operated by ship's force. There was no other damage to gunnery and fire control installations or equipment. All are fully operable.

(d) Electronics.

(1) See remarks re. Mark III radar antenna above. There was no other damage to electronics installations or equipment.

(e) Electrical.

(1) Lens shattered and two vanes bent on 36" searchlight in mainmast superstructure, starboard, frame 100. Searchlight and shutter can be operated but a slight light leak exists. Shutter can be repaired in one hour by ship's force. There was no other damage to electrical installations or equipment.

2. Effect on Fighting Efficiency.

(a) From a point of view relating solely to material, there is no questinn but that the ship could have remained in action, nor would its fighting efficiency have been impaired in any degree except for a slight reduction in speed caused by the casualty to boilers nos. 3 and 4.

SECTION III

1. Observations and Comments.

(a) Material.

(1) Such damage as occurred was caused entirely by heat or air shock and in no case was damage extensive or serious.

(2) Whenever the blast wave or combustion gases could pass quickly over a surface and move beyond it, the effects of these agencies were minimized. All panel failures were in vertical flat surfaces, whereas no curved surfaces showed distortion. All panel failures occured in areas where the blast was trapped by surrounding structure. For example: bulkheads of the Captain's emergency cabin failed because both the deck above and the deck below extended outward several feet in a horizontal direction from the sides and back of the cabin. Curved surfaces also showed less heat effect than adjacent flat surfaces.

(3) Light colored paint showed a tendency to reflect the heat and to resist scorching.

(4) Best available evidence indicates that the maximum blast pressure on weather decks was about 12 lbs/sq. in. and the heat approximately 500°F.

(5) There is no evidence to prove that the ship was actually enveloped by flame. There is, however, abundant evidence that it was in the path of hot gases and black smoke. The effects of heat and air shock were more pronounced on levels below the open bridge, and shadows cast on panels by intervening objects indicate that on lower levels heat gases and smoke were traveling on an almost horizontal plane. It would thus appear that heat and blast traveling in a direct line from the center of the explosion were, on lower levels, augmented in some degree by heat and blast deflected by the surface of the water and channeled to ship in horizontal direction.

(b) Personnel.

(1) Constructive casualties to personnel, with consequent impairment of the ship's fighting efficiency, must be considered simultaneously from the viewpoints of probable causes of injury and degree of preparedness of personnel.

(2) Probable causes would have been:

(a) Radioactivity.

(b) Heat.

(c) Air shock.

(d) Light intensity.

(3) No attempt is made to speculate upon the problematical effect upon personnel of radioactive agents to which they might have been subjected at the instant of the explosion. Suffice to say that within a few hours after the test the ship was radiologically clear throughout for permanent habitation.

(4) In no case would injury have been suffered by personnel below the main deck.

(5) Assumptions in the below listed cases are made on the premise that ship control, sky control, and AA batteries are fully manned:

(a) Case I: Performing station duties but goggles and flashproof clothing not donned. Casualties resulting from heat, air shock and light blindness would have been heavy. Effects from heat and air shock would have been more serious in areas aft of frame 120, in sky control, and in all other areas to starboard of the centerline. Degree of injury from these causes would have been less in stations to port of the centerline and personnel on the bridge would have been affected least of all. All personnel would have been incapacitated in varying degrees by light blindness.

(b) Case II: Performing station duties with goggles and flashproof clothing donned. Casualties from heat would have been less numerous and severe and from light blindness moderate or negligible. Casualties resulting from concussion would probably have been numerous in the critical areas described above but it is believed that fatalities would have been few and a considerable number would have been incapacitated only for periods of short duration.

(c) Case III: If personnel had been forewarned in time to seek shelter behind splinter shields and partial bulkheads and to cover their eyes it is highly probable that casualties in all topside stations would have been slight. There are no visible signs of heat or blast effect in any shielded area on the ship.

2. Recommendations.

(a) Many changes in above water design which are suggested by the effects of the atomic bomb on the NEW YORK have already been incorporated to a limited extent on ships of newer design. Whatever the basic design and the functional requirements of the ship of the future may be, a primary requirement will be maximum resistance to the heat and shock effects of the atomic bomb. In general, this goal could be approached by streamlining external structure in such a manner as to present minimum obstruction to the blast wave from all directions and in particular to prevent the blast from becoming pocketed. To this end flat surfaces should be avoided insofar as is practicable and cylinders, hemispheres and combinations of segments thereof should be used wherever possible. Elevated gun and director platforms and similar structures,necessarily flat surfaces, might well be protected from below by convex shields.

(b) The use of tripods, either for masts or AA mounts is believed inadvisable. The total blast force exerted against them and the structures which they support introduces a leverage effect in which one or more legs provide a fulcrum with a resultant tendency to unstep the leg which is toward the blast. For both fore and mainmast structures the employment of towers in the shape of truncated cones with convex tops, and of a minimum height consistent with their functional requirements, is suggested.

Both towers and stacks should resist being crushed or toppled by blast effect. Construction could embody the use of four or more equally spaced vertical strength members together with horizontal circular frames similar to submarine hull frames. Resistance to toppling could be provided by heavy steel guy wires anchored to strength members of the ship. In order to minimize interference with gunfire, anchor points could be fairly close to the base of the supported structure if secured either tangentially or to points on the opposite side of the structure. Location of anchor points could be calculated so as to afford equal resistance to blast effect in all directions.

(c) Stack structure designed to impede the entrance of outside pressure without restriction of the passage of stack gases is desirable. This could possibly be accomplished by the use of two or more inclined vanes within the stack and with moderate increase in stack diameter to compensate for the restriction introduced.

TECHNICAL INSPECTION REPORT

PART A. GENERAL SUMMARY

I. Target condition after test.

(a) Drafts after test: Fwd 28' 6", Aft 30', Mean 29' 3".

List: None.

General areas of flooding: None.

Sources: None.

(b) Structural damage: None.

Superstructure: Slight dishing of vertical bulkheads of Captain's Sea Cabin. Slight dishing of intake shields around stack.

Hull: None.

Interior of hull: None.

Above and below armored deck: None.

(c) Operability: Ship and equipment fully operable with the exception of after Mark III fire control radar.

(d) Heat: Heat effects on this ship were sufficient to have scorched and blistered dark paint on vertical surfaces directly facing the blast.

Fires: Two class "A" fires.

1. Port signal flag bag caused by the introduction of a flaming foreign substance into the bunting.

2. Aircraft recovery sea sleds stowed on the after side of the after fire control tower caused by ignition of kapok padding.

Estimated personnel casualties: It is believed that personnel casualties would have been heavy in topside areas if personnel had not been equipped with Navy Standard Flash Proof Clothing. It is believed that this clothing would have prevented heavy casualties as evidenced by relatively little heat effect suffered by this vessel.

II. Forces evidenced and effects noted.

(a) Heat.

Apparent direction: Approximately 158° relative.

Extent: All vertical surfaces facing 158° relative from bow to stern on the starboard side show evidence of heat penetration to a depth sufficient to blister the paint. This effect was most pronounced on the starboard after quarter. There is no evidence of heat to port of the centerline. There was no significant behavior of structure of equipment that may be attributed to heat.

(b) Fires and Explosions.

1. A class "A" fire started in the port signal flag bag, signal bridge level. A foreign substance was introduced into this signal stowage igniting the bunting therein. The fire was carried to the deck below as a result of the molten foreign substance flowing out through the bottom drainage holes and igniting the wooden deck and Army Test Material stowed nearby. Approximately fifty square feet of wooden deck, on which the army material was stowed, burned through to the steel deck.

2. A class "A" fire started in the Aircraft Recovery Sea Sled Stowage at the after bulkhead of the secondary fire control tower amidships. The fire was the result of direct ignition of kapok around the sled towing bars. The fire was confined to the stowage.

(c) Shock: No apparent effects from shock.

(d) Pressure: Apparent direction was from approximately 158° rel. The areas affected were those in which the pressure wave apparently became entrapped as evidenced by the dishing effect of the bulkheads of the Captain's Sea Cabin and the dishing of the weather bulkheads around the stack just under the umbrella. There was no other significant behavior of structure or equipment.

(e) There were no effects apparently peculiar to the Atom Bomb.

III. Results of Test on Target.

(a) No effect on propulsion or ship control.

(b) No other effect on gunnery or fire control than the loss of the after Mark III radar antenna.

(c) No effect on watertight integrity and stability.

(d) It is believed that personnel casualties would have been very small if flash clothing had been in use at the time of the detonation. Nothing is known of the effects of gamma ray radiation except that the ship was radiologically cleared on the evening of July 1. Habitability was in no manner affected.

(e) There is no indicated effect upon the total fighting efficiency of the ship.

IV. The damage to this vessel was very light and did not materially reduce the fighting efficiency of the ship. The fact that the vessel was approximately one thousand yards, and upwind, from the point of detonation is worthy of consideration.

V. From the evidence of blast and heat effect on the superstructure of this vessel it is believed that flat vertical and horizontal surfaces should be eliminated insofar as possible.

PART C - INSPECTION REPORT

SECTION I - HULL

Item A. General Description of Hull Damage.

(a) Overall condition of vessel: Vessel suffered only superficial damage. There is no evidence of failure of any main strength members. Paint is scorched in spots along starboard and after side of the hull and superstructure. This scorching is most noticeable on the starboard after quarter. Joiner doors and other non-strength members located in the superstructure show evidence of dishing.

(b) General areas of hull damage: Slight dishing of bulkheads of Captain's Emergency Cabin on navigation bridge level. Rear doors of light gauge metal on navigation bridge level rangefinders dished. Topmost joint of incinerator stack approximately amidships and to port failed. Uptake shields under umbrella of stack dished on all four sides. Doors to ready service boxes and gear lockers on boat deck level and above moderately dished. Several portholes in starboard side of foremast structures cracked. Vent system #111 inoperable due to topside mushroom closure jammed shut.

(c) Apparent causes of hull damage in each area: In all cases the damage appears to be the direct result of a pressure wave or to increased pressures set up in restricted pockets with concurrent inability to equalize pressures.

(d) Principal areas of flooding with sources: There was no flooding due to the bomb detonation.

(e) Residual strength, buoyancy and effect of general condition of hull on operability: There was no effect on strength, buoyancy, or operability.

Item B. Superstructure (exclusive of gun-mounts)

(a) Description of damage, giving important dimensions:

1. Bridge area - Navigation bridge: Plexiglass window on starboard door broken inward. Bulkheads of Captain's Emergency Cabin dished to a maximum depth of 2". Ports in these bulkheads are cracked. Two joiner doors on navigation bridge level carried away at hinges. Starboard rangefinder doors dished 2". Port range finder doors dished 8". Signal Bridge Level: Port flag bag distorted as the result of an intense fire in bunting. Starboard bulkhead of Navigators emergency cabin dished 2".

2. Midship deckhouse and stacks: Incinerator stack parted at topmost joint. Uptake shield under umbrella of stack dished as follows: Stbd fwd-11 1/2", Stbd aft-23", Port fwd-2 1/2", Port aft-3", Fwd-12", Aft-10". Welded joints at corners of half round boundry bars on these bulkheads failed on tension. Joiner door and bulkhead of repair I locker, main deck-port side, frame #48 dished to a maximum depth of 2 1/2".

3. After deckhouse and tower: Starboard flag bag and life net stowage rack atop clip shack on main deck, frame #100 dislocated due to broken welds. Starboard 36" searchlight front lens broken.

(b) Causes of damage in each area: In all cases damage appears to be due to a pressure wave or to a pressure differential due to the restriction in pressure equalization.

(c) Evidences of fire in superstructure:

1. A fire of medium intensity in the port signal flag bag which was caused by the introduction of a foreign substance into the bunting. This substance liquified and was carried to the wooden deck below through the drainage holes in the flag bag. The wooden deck was ignited and carried the fire to Army Quartermaster material nearby.

2. A fire of medium intensity started atop the gravity tank, after side of the fire-control tower amidships. This fire was started by the ignition of kapok padding around the towing bars of two aircraft recovery sea sleds stowed in this location.

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

1. Various plating thicknesses: Plating 3/8" and above not affected. Plating below this thickness was dished when presented in a normal position with the direction of the blast and most notably where the pressure wave became entrapped or when a pressure differential existed.

2. Various shaped surfaces: All dished surfaces were vertical and flat.

3. STS compared to MS: Not enough damage to make comparisons.

4. Aluminum structures (where fitted): None fitted.

(e) Constructive criticism of superstructure design or construction, including important fittings and equipment: Damage not sufficient to make generalizations. However, it is of interest to point out that curved surfaces in close proximity to dished flat surfaces showed no similiar damage. It is believed that curved surfaces should be incorporated in future superstructure design where possible.

Item C. Turrets, Guns and Directors.

(a) Protected Mounts:

1. General condition, including operability, if known: Excellent condition. Fully operable. Outboard starboard surfaces slightly scorched.

2. Effectiveness of installed turrets or shields: Effectiveness of installed turrets excellent. Shields were effective against heat blast and air shock to the height to which they are carried.

(b) Unprotected Mounts:

1. General condition, including operability, if known: Excellent condition. Fully operable. Surfaces exposed to direct heat blast were slightly scorched.

2. Effectiveness and sufficiency of crew shelters. Ineffective. These as installed do not provide sufficient protection against heat or shock wave.

(c) Directors and Range-Finders:

1. General condition, including operability, if known: Excellent condition. Fully operable. Light guage metal doors dished moderately.

2. Condition of instruments therein: Good condition. Train meter glasses (radar) broken in both main battery directors.

(d) Constructive criticism of design or construction of mounts, directors, foundations and shelters: It is believed that the design and construction of mounts, directors, and shelters, including exposed under side of platforms, where not constructed of armor plate, should utilize curved surfaces.

Item D. Torpedo Mounts, Depth Charge Gear.

(a) Torpedo Mounts.

1. Condition of mounts and equipment: None mounted.

2. Degree of protection offered warheads and air flasks: None mounted.

3. Behavior of warheads and air flasks: None mounted.

4. Constructive criticism of location, design and construction: None installed.

(b) Depth Charge Gear.

1. Condition of gear and equipment: None installed.

2. Degree of protection offered charges: None installed.

3. Behavior of charges: None installed.

4. Constructive criticism of location, design and construction: None.

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

(a) General condition of deck and causes of damage: No change due to bomb detonation. After portion of main deck abaft No. 5 turret was deflected downward 5/8'' but regained its original shape.

(b) Usability of deck in damaged condition: Not damaged.

(c) Condition of equipment and fittings.

1. Mooring and towing fittings: Excellent condition.

2. Boats and boat-handling; liferafts: No boats were stowed aboard at time of detonation. Life net stowage rack starboard side, frame #100 was blown off its racks due to broken welds. All life nets and life rafts on the starboard side where exposed to the direct heat blast were slightly scorched.

3. Airplane handling gear: Cranes and airplane catapult undamaged. Aircraft recovery sea sleds burned.

4. Barriers, arresting gear, catapults, etc: Airplane catapult apparently undamaged. The no load test shot has not been fired.

Item F. Exterior Hull (above waterline).

(a) Condition of exterior hull plating and causes of damage: Undamaged. Painted surface on starboard side scorched and slightly blistered. Note: White paint where existing was not blistered.

(b) Condition of exterior hull fitting and causes of damage: No impairment.

(c) Details of any impairment of sheer strakes: No impairment.

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

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

(a) Damage to structure and causes: No damage except as noted in superstructure report.

(b) Damage to joiner bulkheads and causes: No damage except as noted in superstructure report.

(c) Details of damage to access closures and fittings: No damage.

(d) Condition of equipment within compartments: Excellent.

(e) Evidence of fire: None.

(f) Damage in way of piping, cables, ventilation ducts, etc: Topside closure of ventilation system #111 inoperable due to blast forcibly closing an imperfectly closed topside closure.

(g) Estimate of reduction in water-tight subdivision; habitability and utility of compartments: No change.

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

(a) Damage to armor deck and causes of damage. No damage.

(b) Protection afforded spaces below. Excellent.

(c) Condition around openings.

1. Hatches: Unchanged. Excellent condition.

2. Gratings: Undamaged.

3. Uptake bulkheads: Undamaged.

4. Barbettes: Undamaged.

ITEM I. Interior Compartment (below waterline).

(a) Damage to structure and causes. Undamaged.

(b) Damage to joiner bulkheads and causes: Undamaged.

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

(d) Condition of equipment within compartments: Excellent.

(e) Floodings: None.

(f) Damge in way of piping, cables, ventilation ducts, shafts, etc: No damage.

(g) Estimate of reduction in watertight subdivision, habitability, and utility of spaces: No change.

Item J. Underwater Hull.

(a) Interior inspection of underwater hull: No leakage evident.

(b) Effect of damage on buoyancy, operability, maneuverability: No change.

(c) Any known or suspected damage to:

1. Shafts and propellers: None.

2. Struts: Undamaged.

3. Rudders: Undamaged.

4. External Keels: No damage suspected.

(d) Details of impairment of keel structure: None suspected.

Item K. Tanks.

(a) Condition of tanks in areas of damage: No damage.

(b) Contamination of liquids:

1. Extent and cause, if known: Not known.

2. Effect on ship operability: None.

(c) Damage (known or suspected) to torpedo defense systems: None suspected.

Item L. Flooding.

(a) Description of major flooding areas: No flooding occurred.

(b) Sources of flooding:

1. Opened boundaries: No flooding occurred.

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 damage control: None.

Item M. Ventilation (exclusive of blowers).

(a) Damage to ventilation system and causes.

1. Ducts. The duct leading to the blower of system #111 was slightly distorted as the result of pressure wave entering system through improperly closed topside closure.

2. Closures. The topside closure of system #111 at frame #112, port was forced shut shearing anchor bolts and forcing the operating lever against the overhead at frame #111.

3. Effect on habitability. None.

(b) Evidences that ventilation system conducted heat, blast, fire or smoke below decks: There is some evidence that blast was carried below decks through imperfectly seated closures in the extraordinary amount of dust, dirt, and typical ventilation system debris found on the second deck.

(c) Evidences that ventilation system allowed progressive flooding: No flooding occurred.

(d) Constructive criticism of design and construction of system: Constructive criticism of the old design of ventilation systems as installed in this vessel would be of little value in view of the excellence of the modern systems and their damage control characteristics.

Item N. Ship Control.

(a) Damage to ship control stations and causes.

1. Bridge area: No damage.

2. C.I.C. No damage.

3. Gyro-compass equipment: No damage, excellent condition. Fully operable.

4. Steering gear. Undamaged.

5. Interior Communications. Excellent condition.

(b) Constructive criticism of ship control systems.

1. Layout and arrangement: None.

2. Location with respect to protection. Physical forces were from starboard after side therefore protection was adequate in this particular instance. Location of ship control instruments within the foremast tower, as is the present practice in some modern capital ships, would probably afford adequate protection in all directions.

Item O. Fire Control.

(a) Damage to fire control stations and causes.

1. Directors and elevated control positions: Excellent conditions. Optics undamaged.

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 fire control stations have inadequate personnel protection.

(c) Constructive criticism of location and arrangement of stations: All topside firecontrol stations must be radically redesigned in such a manner as to avoid entrapment of pressure waves with resultant distortion of platforms. AA firecontrol stations could include a semi-spherical dome structure of high strength plexiglass.

Item P. Ammunition Behavior.

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

1. Main battery: No damage - Gun rooms and shell decks apparently provided good protection.

2. Secondary battery: No damage.

3. 40mm, 20mm, and other: 3"/50 ammunition located in ready box on port boat deck was badly overheated by a class "A" fire which originally started in signal flag bag above and fell below igniting the deck and Army test material. All other types located in ready service boxes and rooms topside undamaged.

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

1. Main battery powder and projectiles: Location 1st platform. No visible forces involved. Excellent condition.

2. Secondary battery: Location - 2nd platform. No visible forces involved. Excellent condition.

3. 40mm, 20mm, and other: Location - 2nd platform and hold. No visible forces involved. Excellent condition.

4. Bomb, Mine, Depth Charge and Torpedo stowage. No visible forces involved. Excellent condition.

(c) List of stowages which are insufficiently protected and effects on ship survival of explosion of each stowage: 5"/51 stowed on outboard bulkheads of both aircastles. No effect upon ship survival.

(d) Behavior of gasoline stowage facilities: No damage to gasoline stowage nor to gasoline line on starboard side of hull.

Item Q. Ammunition Handling.

(a) Condition and operability of ammunition handling devices: Excellent condition.

1. Main battery hoists: Excellent condition.

2. Secondary battery hoists. Excellent condition.

3. Passing scuttles. Excellent condition.

4. Bomb and Torpedo Elevators. None aboard.

(b) Evidences that any ammunition handling devices contributed to passing of heat, fire, blast or flooding water. No evidence.

(c) Constructive criticism of design and construction of ammunition handling devices. None from effects noted in this vessel.

Item R. Strength.

(a) Permanent hog or sag.

1. Hull evidence: No visible signs of permanent hog or sag due to bomb.

2. Superstructure expansion joints, etc: No expansion joints in this vessel.

3. Local evidences of longitudinal stresses. No evidence.

(b) Shear strains in hull plating: No evidence of shear strains.

(c) Evidences of transverse or racking strains. No evidence of transverse or racking strains.

(d) Details of any local failures in way of structural discontinuities. None

(e) Evidence of panel deflection under blast. No such evidence.

(f) Turret, machinery and gun foundations. All intact.

Item S. Miscellaneous.

(a) Evidence of heat damage variations under various colors of camouflage painting: All light color paints showed evidence of reflection of heat wave where nearby dark paints were scorched or blistered.

(b) Etc. Other miscellaneous effects or condition noted during inspection. None.

PART C - INSPECTION REPORT

SECTION II - MACHINERY

Item A. General Description of machinery damage.

(a) Overall condition: Overall condition of the machinery and its spaces is good.

(b) Areas of major damage: The area which may be considered as being in a state of major damage is the #2 fireroom. Ship's force can place this fireroom back in commission in 3 or 4 days.

(c) Primary causes of damage in each area of major damage: Pressure down the stack.

(d) Effect of target test on overall operation of machinery plant: The bomb affected the overall operation of machinery plant very little.

Note: On each of the following groups of machinery B to W, significant damage should be described and analyzed for effect upon operation of the machinery plant, AND FOR CAUSE. Where damage warrants a further more detailed technical inspection, emphasize this fact.

Item B. Boilers (S51) Boiler casings.

(a) Boiler casings:

#1 boiler lower casing panel, inboard and outboard sides buckled but did not blow off.

#2 boiler lower casing panel, inboard and outboard sides buckled but did not blow off.

#3 boiler, inboard lower casing blown off, ripping casing bolt holes rendering #3 boiler out of commission.

#4 boiler, inboard lower casing panel blown loose. Out of commission.

#5 boiler, outboard lower panel casing buckled but not blown off.

#6 boiler, outboard upper casing buckled. No other damage.

(b) Air casings: No air casings (Forced draft firerooms)

(c) External fittings (stop and check valves, safety valves, etc.): No damage.

(d) Fuel oil burner assemblies: No damage.

(e) Brick work and furnaces: No damage in any of the boilers.

(f) Steam and water drum and headers: No damage.

Item C. Blowers (S-53)

(a) Turbines or motors: No damage.

(b) Blowers: No damage.

(c) Foundations: No damage.

(d) External fittings (gages, piping, oil coolers, etc.): No damage.

(e) Shutter (air intake, automatic, etc.): No damage.

(f) Blower rooms (air lockers if enclosed firerooms): No damage.

Item D. Fuel oil equipment (S-55)

(a) Heaters: No damage.

(b) Strainers: No damage.

(c) Manifolds: No damage.

(d) Fittings (thermometers, gages): No damage.

Item E. Boiler feedwater equipment (S-56)

(a) Heaters: No damage.

(b) Deaerating tanks: There are no deaerating tanks aboard.

(c) Feed-water tanks (hot well, filter, etc.): No damage.

(d) Miscellaneous: No damage.

Item F. Main turbines (S-41).

(a) Casings: None on ship.

(b) Bearings: None on ship.

(c) Rotors: None on ship.

(d) Blading and shrouding: None on ship.

(e) Packing and glands on main engines: No damage.

(f) Valves: No damage.

(g) Foundations: No visible damage.

(h) Fittings (oilsights, thermometers, clearance indicators, etc.): No damage.

Item G. Reduction gears (S-42)

(a) Foundations and casings: None on ship.

(b) Gears and shafting: None on ship.

(c) Bearings: None on ship.

(d) Couplings (flexible and solid): None on ship.

(e) Fittings (oilsights, thermometers, etc.): None on ship.

(f) Turning gears: None on ship.

Item H. Shafting and bearings (S-43)

(a) Shafting: No visible damage.

(b) Bearings and bearing foundations: No visible damage.

(c) Alignment: No visible damage.

(d) Stern tubes, bulkhead packing glands, etc.): No visible damage.

Item I. Lubrication system (S-45).

(a) Coolers: No damage.

(b) Filters and strainers: No damage.

(c) Purifiers: No visible damage.

(d) Tanks (sump, settling, etc.): No visible damage.

(e) Fittings (gauges, etc.): No damage.

Item J. Condensers (S-46)

(a) Water boxes: No damage.

(b) Shell and shell connections: No damage.

(c) Expansion joints: No expansion joints on condenser lines.

(d) Air ejectors: No air ejectors; air pumps are used instead and they have not been damaged.

(e) Inter and after condensers: None on the ship.

(f) Miscellaneous valves, guages, fittings, and attached piping: No damage.

Item K. Pumps (S-47)

Report most pumps under this heading, discussing for each the foundations, operability, condition of motor or turbine, fittings, etc.

(a) Feed pumps: No damage.

(b) Circulating pumps: No damage.

(c) Condensate pumps: No condensate pumps on the ship.

(d) Fire pumps: No damage.

(e) Lub oil pumps: No damage.

(f) Fuel oil pumps: No damage.

(g) Other pumps: No pumps on the ship are damaged.

Item L. Auxiliary generators (turbine and gears) (S-61)

(a) Foundations and misalignment: No damage.

(b) Turbines: No damage.

(c) Gears: No damage.

(d) Coolers: No damage.

Item M. Propellers (S-44)

(a) Blades: Not inspected.

(b) Caps, nuts, etc: No inspected.

Item N. Distilling Plant (S-58)

(a) Evaporators: No visible damage.

(b) Distilling condensers: No visible damage.

(c) Evaporator feed heaters: No visible damage.

(d) Miscellaneous valves, fittings, gages, attached piping, etc: No visible damage.

Item O. Refrigerating plant (S-59)

(a) Compressors: No damage.

(b) Motors: No damage.

(c) Condensers: No damage.

(d) Foundations: No damage.

(e) Refrigerant piping and cooling coils: No damage.

(f) Insulation and lagging: No damage.

(g) Miscellaneous valves, switches, controls, fittings, etc.: No damage.

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

(a) Foundations and bedplates: No visible damage.

(b) Motors: No visible damage.

(c) Brakes and brake lining: No visible damage.

(d) Gearing: No visible damage.

(e) Hydraulic systems: No visible damage.

(f) Drums, bearings, shafting: No visible damage.

(g) Fittings, wildcats, valves, etc: No visible damage.

Item Q. Steering engine (S-22)

(a) Foundations: Not inspected yet. No visible damage.

(b) Ram, quadrant, chains, screws, etc.: No visible damage.

(c) Hydraulic system, in cluding pumps, piping, etc.: No visible damage.

(d) Follow up system: No visible damage.

(e) Motors or engines: No visible damage.

(f) Miscellaneous (steering stands, gages, etc.): No visible damage.

Item R. Elevators, ammunition hoists, etc. (S-78, 83)

(a) Machinery foundations: No visible damage.

(b) Motors and gearing: No visible damage.

(c) Hydraulic systems: No visible damage.

(d) Guide rails, dredger chains, etc: No visible damage.

(e) Elevator platforms: No visible damage.

(f) Brakes and brake lining: No visible damage.

(g) Control systems and follow up gear: No visible damage.

(h) Miscellaneous: No visible damage.

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

(a) Fans and motors: 3-48-2 Impeller housing caved in due to blast. Housing jammed impeller.

(b) Foundations: No damage.

(c) Heaters: No damage.

(d) Miscellaneous: No damage.

Item T. Air Compressors. (S-49)

(a) Foundations: No damage

(b) Compressors and motors: No damage.

(c) Coolers: No damage.

(d) Tanks: No damage.

(e) Miscellaneous gages, attached piping, etc.: No damage.

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

(a) Foundations: No damage.

(b) Casings and cylinders: No damage.

(c) Bearings, crankshafts, pistons, etc: No damage.

(d) Fuel injection system: No damage.

(e) Superchargers: No on ship.

(f) Governors: No damage.

(g) Miscellaneous: No damage.

Item V. Piping.

Piping will require a somewhat different inspection approach than the machinery groups above. Conditions should be noted while moving from compartment to compartment, notes being made on a piping system basis according to the following list. Particular attention should be paid to weak design points, adequacy of parallel systems to take over functions, and probably effect of damage on personnel as well as on operation.

(a) Main steam: No visible damage.

(b) Auxiliary steam: No visible damage.

(c) Auxiliary exhaust: Air exhaust to atmosphere caved in by the skirting around stack ripping line approximately 6".

(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) Condenser circulating water: No damage.

(i) Drain: No damage

(j) Compressed air: No damage.

(k) Hydraulic: Not inspected.

(l) Gasoline: Not inspected.

(m) Other systems: No damage.

Item W. Miscellaneous.

Machinery not included in above should be covered here.

PART C - INSPECTION REPORT

SECTION III - ELECTRICAL

Item A. General Description of Electrical Damage.

(a) Overall condition.

Bomb blast had no effect on any electrical equipment, except 36" searchlight on starboard side of mainmast.

(b) Areas of Major Damage.

Starboard side of mainmast.

(c) Primary Causes of Damage in each area of major damage.

Pressure wave or shock.

(d) Operability of Electric Plant.

1. Ships service generator plant.

No damage.

2. Engine and Boiler Auxiliaries.

No damage.

3. Electrical Propulsion

None Aboard.

4. Communications.

No Damage.

5. Fire Control Circuits.

No Damage.

6. Ventilation.

Vent set 3-48-2 not operable due to impeller housing sprung out of shape. No electrical damage.

7. Lighting.

No Damage.

(e) Types of Equipment Most Affected.

1. Switchboards and Switch gear.

No Damage.

2. Rotating Machinery.

No Damage.

3. Motor Controllers.

No Damage.

4. Cables and Supports.

No Damage.

NOTE: For each piece of equipment listed below, include information concerning the primary cause of damage, the nature and approximate extent of damage, and the effect upon the operability of the piece or complete assembly.

Item B. Electric Propulsion Rotation Equipment (Propulsion motors, propulsion generators, submarine auxiliary generators, exciters, motor-generator sets). (S-41)

(a) Frame and mountings.

None Aboard.

(b) Commutator or slip rings.

None Aboard.

(c) Brushes and brush rigging.

None Aboard.

(d) Bearings.

None Aboard.

(e) Fans or blowers.

None Aboard.

(f) Internal lighting fixtures.

None Aboard.

(g) Air coolers and filters.

None Aboard.

Item C. Electric Propulsion Control Equipment (propulsion Control dubicles, transfer switch panels, controllers for motor-generator sets). (S-41).

(a) Framework and mountings.

None Aboard.

(b) Electrical connections and iring.

None Aboard.

(c) Busbars.

None Aboard.

(d) Contactors, switches and relays.

None Aboard.

(e) Rheostats and resistors.

None Aboard.

(f) Mechanical operating mechanisms and interlocks.

None Aboard.

(g) Insulating materials.

None Aboard.

(h) Instruments.

None Aboard.

(i) Rectifiers.

None Aboard.

(j) Fuses.

None Aboard.

(k) Regulators.

None Aboard.

Item D. Generators - Ships Service (S-61)

No Damage.

Item E. Generators - Emergency (S-61)

(a) Frame and Mounting.

No Damage.

(b) Commutators or Slip Rings.

No Damage.

(c) Brushes and Brush Rigging.

No Damage.

(d) Bearings.

No Damage.

(e) Fans.

No Damage.

(f) Balance Coils.

No Damage.

Item F. Switchboards, Distribution and Transfer Panels (Ships Service, Emergency, Battery Charging, Lighting and Test Switchboards- Power and Lighting Distribution Panels - Submarine Torpedo Heating and Hydrogen Burning Panels - Transfer Panels - Degaussing Panels). (S-62)

(a) Framework and Mountings.

No Damage.

(b) Electrical Connections and Wiring.

No Damage.

(c) Busbars.

No Damage.

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

No Damage.

(e) Rheostats and Resistors.

No Damage.

(f) Mechanical Operating Mechanisms and Interlocks.

No Damage.

(g) Insulating Materials.

No Damage.

(h) Instruments.

No Damage.

(i) Rectifiers.

No Damage.

(j) Fuses.

No Damage.

(k) Voltage Regulators.

No Damage.

Item G. Wiring, Wiring Equipment, and Wireways. (S-62)

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

No Damage.

(b) Wireway Supports

No Damage.

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

No Damage.

Item H. Transformers (lighting and I.C. (S-62)

(a) Framework and mountings.

No Damage.

(b) Electrical connections.

No Damage.

Item I. Submarine Propelling Batteries (S-62)

(a) Jars.

No Damage.

(b) Covers.

No Damage.

(c) Wedges and Strongbacks.

No Damage.

(d) Busbars and cell connections

No Damage.

(e) Acid spillage.

None.

Item J. Portable Batteries. (S-62)

(a) Mounting.

No Damage.

(b) Jars.

No Damage.

(c) Cell and Cable Connections.

No Damage.

(d) Acid spillage.

None.

Item K. Motors, Motor Generator Sets, and Motor Controllers (Motor and Controllers for Engine Room Auxiliaries, Steering Gear, Deck Auxiliaries, Air Conditioning and Refrigeration, Ventilation, Distilling Equipment, etc. Motor Generator Sets for Lighting, Welding, Degaussing, Battery Charging, Interior Communications, etc.) (S-63)

(a) Rotating Equipment.

1. Framework and Mounting.

No Damage.

2. Commutator or Slip Rings.

No Damage.

3. Brushes and Brush Rigging.

No Damage.

4. Bearing.

No Damage.

5. Speed Regulators.

No Damage.

(b) Control Equipment.

1. Framework and Mounting.

No Damage.

2. Electrical Connections and Wiring.

No Damage.

3. Contactors, Switches and Relays.

No Damage.

4. Rheostats and Resistors.

No Damage.

5. Insulating Materials.

No Damage.

6. Pilot Circuit Devices.

No Damage.

7. Brakes.

No Damage.

Item L. Lighting Equipment (S-64)

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

No Damage.

(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.

No Damage.

Item M. Searchlights (36", 24", 12", and 8") (S-66).

(a) Framework and mountings.

No Damage.

(b) Front Glass.

#1-36" Searchlight front glass shattered.

#2-36" Searchlight front glass no damage.

(c) Shutter and Operating Mechanism.

#1-36" searchlight, iris shutter, two (2) vanes bent out of shape, causing light leakage. Does not interfere with operation of shutter. Repair entails about 1 man hour to complete.

(d) Locks and brakes.

No Damage.

(e) Arc Lamp feed rods.

No Damage.

(f) Incandescent lamps.

No Damage.

(g) Rheostats.

No Damage.

Item N. Degaussing Equipment (S-61)

(a) Compass compensating coils and control boxes.

No Damage.

(b) Connection boxes.

No Damage.

(c) Heading switches and relays.

No Damage.

Item O. Gyro Compass Equipment.

(a) Master.

No Damage.

(b) Repeaters.

No Damage.

(c) DRA AND DR T:

No Damage.

Item P. Sound Powered Telephones.

(a) Headsets.

No Damage.

(b) Handsets.

No Damage.

(c) Jack and Switch Boxes.

No Damage.

(d) Stowage.

No Damage.

Item Q. Ships Service Telephones.

(a) Exchange.

No Damage.

(b) Line Equipment.

No Damage.

Item R. Announcing Systems.

(a) Portable (PAM and PAB)

No Damage.

(b) Amplifier Racks.

No Damage.

(c) Control Racks.

No Damage.

(d) Transmitting Station.

No Damage.

(e) Reproducers.

No Damage.

(f) Inter-Communicating Units.

No Damage.

Item S. Telegraphs.

No Damage.

Item T. Indicating Systems.

No Damage.

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

No Damage.

Item V. F.C. Switchboards.

No Damage.

PART C - INSPECTION REPORT

SECTION IV - ELECTRONICS

Item A. General Description of Electronics. Damage.

(a) Overall Condition.

Excellent with the exception of the after Mark III (fire control) antenna.

(b) Areas of Major Damage.

The after Mark III (fire control) antenna was blasted from its turntable. The aluminum casing supports were all broken. There is no evidence of dishing in the antenna, and after a fall into the boat deck, approximately thirty feet below, the glass and plastic diapole covers were intact.

(c) Primary cause of damage in each area.

Pressure wave.

(d) Operability of Electronics Equipment.

1. Radar. Excellent.

2. Radio. Excellent.

3. Sonar. Excellent.

4. Loran. Not tested.

5. Other. All other electronic equipment is in excellent condition.

(e) Types of Equipment most affected

Radar antennas.

Item B. through V.

(a) It is not considered feasible to break down the electronics material items further due to the complexity of the equipment involved. If a further formalization of the electronics section of this report is considered advantageous at some future date, the necessary outlines will be provided.

(b) The index of items B through V is designed to be applicable equally to:

1. Airborne Electronics Equipment.

2. Shipborne and Shore Electronics Equipment.

3. Army Electronics Equipment.

and will be used for those inspections.

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Classification (~~Cancelled~~) (Changed to _____)
By Authority of Joint Chiefs of Staff Action of 15 April 1949
By [illegible] Capt date [illegible]
AFSW-8

[redacted] 1946

CONFIDENTIAL

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

TRC

10 April 1997

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

SUBJECT: Declassification of Reports

The Defense Special Weapons Agency (formerly Defense Nuclear Agency) Security Office has reviewed and declassified the following reports:

AD-366718	XRD-32-Volume 3	
AD-366726	XRD-12-Volume 2	
AD-366703	XRD-16-Volume 1	
AD-366702	XRD-14-Volume 2	
AD-376819L	XRD-17-Volume 2	
AD-366704	XRD-18	
AD-367451	XRD-19-Volume 1	
AD-366705	XRD-20-Volume 2	AD-366705
AD-376028L	XRD-4	
AD-366694	XRD-1	
AD-473912	XRD-193	
AD-473891	XRD-171	
AD-473899	XRD-163	
AD-473887	XRD-166	
AD-473888	XRD-167	
AD-473889	XRD-168	

TRC 10 April 1997

SUBJECT: Declassification of Reports

AD-B197749	XRD-174
AD-473905	XRD-182
AD-366719	XRD-33 Volume 4
AD-366700	XRD-10
AD-366712	XRD-25 Volume 1
AD-376827L	XRD-75
AD-366756	XRD-73
AD-366757	XRD-74
AD-366755	XRD-72
AD-366754	XRD-71
AD-366710	XRD-23 Volume 1
AD-366711	XRD-24 Volume 2
AD-366753	XRD-70
AD-366749	XRD-66
AD-366701	XRD-11
AD-366745	XRD-62.

All of the cited reports are now **approved for public release; distribution statement "A" applies.**

Ardith Jarrett
ARDITH JARRETT
Chief, Technical Resource Center

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