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CONFIDENTIAL
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BUREAU OF SHIPS GROUP TECHNICAL INSPECTION REPORT

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Classification (Cancelled) (changed to ~~CONFIDENTIAL~~ Security Information)
By Authority of JOINT CHIEFS OF STAFF JCS 1795/38 DATED 15 APRIL 1949
By John F. Coyette Date 24 SEP 1958

1729033

OPERATION CROSSROADS.
U.S.S. CONYNGHAM (DD371)
TEST ABLE [U].

U. S. GOVERNMENT AGENCIES MAY OBTAIN COPIES OF THIS REPORT DIRECTLY FROM DDC. OTHER GOVERNMENT AGENCIES SHALL REQUEST THROUGH

(11) 1947, (12) 35 P.
(14) XRD-35

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

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DIRECTOR OF SHIP MATERIAL
JOINT TASK FORCE ONE

SECRET

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

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USS CONYNGHAM (DD371)

U.S.S. CONYNGHAM (DD371)

SHIP CHARACTERISTICS

Building Yard: Boston Naval Shipyard.

Commissioned: 4 November 1936.

HULL

Length Overall: 341 feet 4 inches.

Length on Waterline: 334 feet 0 inches.

Beam (extremé): 35 feet 5 inches.

Depth (molded at side, to main deck, amidships):
19 feet 7 7/8 inches.

Drafts at time of test: Fwd. 12 feet 10 inches.

Aft. 11 feet 4 inches.

Standard displacement: 1,500 tons.

Displacement at time of test: 2,066 tons.

MAIN PROPULSION PLANT

Main Engines: Two sets of G.E. turbines, one per shaft.

Reduction Gears: Two sets De Laval double reduction one per turbine set.

Condensers: Two are installed in ship.

Boilers: Four boilers, Babcock and Wilcox and foster Wheeler design. 400 psi gauge - 700° F.

Propellers: Two are installed.

Main shafts: Two are installed.

Ship's Service Generators: Two 132 KW. - A.C.
and Two 40 KW. - D.C. All four are turbo generators.

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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

No structural damage occurred in this ship as a result of Test A.

MACHINERY

No comment.

ELECTRICAL

Not observed.

(c) Other damage.

HULL

No damage was sustained by propulsion or other machinery.

MACHINERY

There is no damage to machinery of this vessel.

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ELECTRICAL

There was no damage to electrical equipment.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

Heat from the blast scorched slightly the outer layer only, of paint on vertical surfaces of the after side of the signal bridge, and of the after face of the deckhouse, frames 158-159. There was no scorching of fire hose, canvas, or manila.

MACHINERY

No evidence.

ELECTRICAL

There was some blistering of paint work on the vessel due to radiant heat from the blast.

(b) Fires and explosions.

HULL

There were no fires or explosions.

MACHINERY

No evidence.

ELECTRICAL

There were no fires or explosions on the vessel.

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(c) Shock.

HULL

No shock effects were noted.

MACHINERY

No evidence.

ELECTRICAL

There were no effects of shock found in electrical equipment.

(d) Pressure.

HULL

The explosion bearing was approximately 170 degrees relative. A sheet metal door of a damage control locker at frame 56 starboard, main deck, was perceptibly dished. Soot which had collected in the stacks was blown back into the firerooms and some dust was blown back through exhaust vents.

MACHINERY

No evidence.

ELECTRICAL

There were no effects of pressure found in electrical equipment.

(e) Effects peculiar to the atom bomb.

HULL

None, except heat.

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MACHINERY

None.

ELECTRICAL

The scorching of painted surfaces by the radiant heat of the bomb is the only effect apparently peculiar to the atom bomb.

III. Results of Test on Target.

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

HULL

None.

MACHINERY

None. All machinery on this vessel that was operable before Test A was operated after it, and functioned normally.

ELECTRICAL

None due to electrical damage.

(b) Effect on gunnery and fire control.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None due to electrical damage.

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(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None due to electrical damage.

(d) Effect on personnel and habitability.

HULL

Habitability was not affected. Personnel in exposed topside locations probably would have suffered burns.

MACHINERY

None.

ELECTRICAL

None due to electrical damage.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

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ELECTRICAL

None due to electrical damage.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

Except for slight effect of heat, this ship was out of the damaging range of Test A.

MACHINERY

The CONYNGHAM was outside the effective range of the explosion in Test A.

ELECTRICAL

The vessel was very slightly affected by the blast. There was no damage. The lack of general damage indicate that no assumption as to the ruggedness of electrical equipment may be made based on the performance here.

V. Preliminary Recommendations.

HULL

No comment.

MACHINERY

None.

ELECTRICAL

None.

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TECHNICAL INSPECTION REPORT

SECTION I - HULL

GENERAL SUMMARY OF HULL DAMAGE

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.

No structural damage occurred in this ship as a result of Test A.

(c) Other damage.

No damage was sustained by propulsion or other machinery.

II. Forces Evidenced and Effects Noted.

(a) Heat.

Heat from the blast scorched slightly the outer layer only, of paint on vertical surfaces of the after side of the signal bridge, and of the after face of the deckhouse, frames 156-159. There was no scorching of fire hose, canvas, or manila.

(b) Fires and explosions.

There were no fires or explosions.

(c) Shock.

No shock effects were noted.

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(d) Pressure.

The explosion bearing was approximately 170 degrees relative. A sheet metal door of a damage control locker at frame 56 starboard, main deck, was perceptibly dished. Soot which had collected in the stacks was blown back into the firerooms and some dust was blown back through exhaust vents.

(e) Effects peculiar to the Atomic Bomb.

None, except heat.

III. Results of Test on Target.

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

None.

(b) Effect on gunnery and fire control.

None.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

Habitability was not affected. Personnel in exposed topside locations probably would have suffered burns.

(e) Effect on fighting efficiency.

None.

IV. General Summary of Observers' Impressions and Conclusions.

Except for slight effect of heat, this ship was out of the damaging range of Test A.

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V. Preliminary Recommendations.

No comment.

VI. Instructions for loading the vessel specified the following:

ITEM	LOADING
Fuel oil	50%
Diesel oil	50%
Ammunition	50%
Potable and reserve feed water	Full load
Salt water ballast	150 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 for inspection in the Bureau of Ships Crossroads Files.

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DETAILED DESCRIPTION OF HULL DAMAGE

A. General Description of Hull Damage.

No structural damage occurred in this ship as a result of Test A. General photographs of the exterior after the test and paint scorching are shown on pages 31 to 33 inclusive.

The explosion bearing was approximately 170 degrees relative.

B. Superstructure.

Heat from the blast scorched slightly the outer layer only, of paint on vertical surfaces of the after side of the signal bridge, and the starboard after quartering face of the deckhouse, frames 156-159.

C. Guns and Directors.

No damage.

D. Torpedo Mounts, Depth Charge Gear.

No damage.

E. Weather Deck.

No damage. A deck deflection gage located at frame 20, main deck, centerline, recorded a 1/4 inch downward deflection and recovery of the forecastle deck. Other deck deflection gages recorded no movement of the weather deck.

F. Exterior Hull.

No damage.

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G. Interior compartments (above w.1.).

No damage.

H. Armor Decks and Miscellaneous Armor.

Not applicable.

I. Interior Compartments (below w.1.).

No damage occurred. Soot which had collected in the stacks was blown back into the fire rooms.

J. Underwater Hull.

No damage.

K. Tanks.

No damage.

L. Flooding.

None.

M. Ventilation.

No damage occurred. Lint and dust were blown back into a number of spaces through exhaust vents.

N. Ship Control.

No damage.

O. Fire Control.

No damage.

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P. Ammunition Behavior.

No damage.

Q. Ammunition Handling.

No damage.

R. Strength.

No damage.

S. Miscellaneous.

No comment.

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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.

No comment.

(c) Other damage.

There is no damage to machinery of this vessel.

II. Forces Evidenced and Effects Noted.

(a) Heat.

No evidence.

(b) Fires and explosions.

No evidence.

(c) Shock.

No evidence.

(d) Pressure.

No evidence.

(e) Effects apparently peculiar to the atom bomb.

None.

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III. Effects of Damage.

(a) Effect on machinery and ship control.

None. All machinery on this vessel that was operable before Test A was operated after it, and functioned normally.

(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.

None.

(e) Total effect on fighting efficiency.

None.

IV. General Summary.

The CONYNGHAM was outside the effective range of the explosion in Test A.

V. Preliminary Recommendations.

None.

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DETAILED DESCRIPTION OF MACHINERY DAMAGE

A. General Description of Machinery Damage.

(a) Overall condition.

The overall condition of the machinery was not changed by Test A.

(b) Areas of major damage.

None.

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

Not Applicable.

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

The test had no effect on the operation of the machinery plant. The ships engineering material will permit full power operation. She was underway for 1-1/2 hours after Test A, at speeds up to 10 knots. At this time all machinery that was operable before Test A was operated, and functioned normally.

B. Boilers.

There was no damage to boilers, uptakes, or stacks. Hydrostatic tests of boilers 1 and 2, and air tests of the casings of boilers 3 and 4, taken before and after Test A, indicate no change in performance. Boilers 3 and 4 were steamed after Test A.

HYDROSTATIC TESTS ON BOILER #2

	Before Test A	After Test A
Initial Pressure	500 lb/sq. in.	500 lb/sq. in.
Pressure remaining after		
24 hours	420 lb/sq. in.	
51 hours		350 lb/sq. in.

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C. Blowers.

Undamaged. All blowers were run for at least 30 minutes under load after Test A.

BLOWER R.P.M. TEST

	Before Test A	After Test A
Pressure #1 fire room	11.9''	11.9''
Blower RPM #2 FD blower	4900	4500

D. Fuel Oil Equipment.

Undamaged. All equipment has been operated under service conditions since Test A, and functioned normally.

E. Boiler Feedwater Equipment.

Undamaged. All boiler feedwater equipment was used while the ship was underway at 10 knots.

F. Main Propulsion Machinery.

Undamaged. The main turbines were used under-way and operated satisfactorily with no apparent defects. Readings of leads left in bearings of the starboard low pressure turbine during Test A are inconclusive, but indicate no appreciable motion of the rotor.

STARBOARD ENGINE - L.P. TURBINE - FORWARD BEARING

Forward lead	Before Test A	After Test A	Difference
Port	.010	.010	.000
Top	.017	.017	.000
Stb'd	.010	.012	+ .002
Center Lead			
Port	.009	.008	.001
Top	.017	.018	+ .001
Stb'd	.009	.010	+ .001

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After lead	Before Test A	After Test A	Difference
Port	.011	.009	.002
Top	.018	.018	.000
Stb'd	.009	.010	+ .001

STARBOARD ENGINE - L.P. TURBINE - AFTER BEARING

Forward lead

Port	.009	.008	.001
Top	.011	.010	.001
Stb'd	.009	.010	+ .001

After lead

Port	.009	.008	.001
Top	.014	.012	.002
Stb'd	.009	.010	+ .001

G. Reduction Gears.

Undamaged. The reduction gears have been thoroughly inspected and operated under service conditions since Test A.

H. Shafting and Bearings.

Undamaged. All shafting and bearings were checked while the ship was underway after Test A. No abnormal conditions were noted.

I. Lubrication System.

Undamaged. The lubrication system was checked while the main engines were in operation after Test A.

J. Condensers and Air Ejectors.

Undamaged. The condensers and air ejectors operated satisfactorily while the ship was underway. Condenser vacuum was 29".

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K. Pumps.

1. Undamaged.
2. No. 1 emergency feed pump and the cruising feed pump were inoperable prior to Test A. Their condition was not changed by Test A.
3. All other pumps were operated under service conditions after Test A, and functioned normally.

L. Auxiliary Generators (Turbines and Gears).

The turbo-generators were operated under service conditions after Test A.

M. Propellers.

Undamaged. They were checked while the ship was underway after Test A. Operation was normal.

N. Distilling Plant.

Undamaged. The distilling plant has been in operation after Test A, operation normal.

O. Refrigeration Plant.

Undamaged. All equipment has been operated satisfactorily after Test A.

P. Winches, Windlasses, and Capstans.

Undamaged. All equipment has been operated under load satisfactorily after Test A.

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Q. Steering Engine.

Undamaged. All equipment was operated while the ship was underway after Test A.

R. Elevators, Ammunition Hoists, Etc..

Undamaged. All equipment has been operated under load satisfactorily since Test A.

S. Ventilation (Machinery).

Undamaged. Two exhaust vent fans were inoperable before Test A. Their condition was unchanged after it. All other ventilation machinery was operated after Test A, and functioned normally.

T. Compressed Air Plant.

Undamaged. All compressors have been operated satisfactorily since Test A. The low pressure air compressor was in poor operating condition prior to Test A due to leaky gaskets on the compressor and a leaky 3rd stage discharge line. Its condition was unchanged by Test A.

U. Diesels (Generators and Boats).

Undamaged. The diesel generator was operated for one hour after Test A.

V. Piping Systems.

Undamaged. All piping held operating pressures after the test.

W. Miscellaneous.

All galley, laundry, machine shop equipment has been operated since Test A and found satisfactory.

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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.

There was no flooding. Drafts and list were not observed.

- (b) Structural damage.

Not observed.

- (c) Other damage.

There was no damage to electrical equipment.

II. Forces Evidenced and Effects Noted.

- (a) Heat.

There was some blistering of paint work on the vessel due to radiant heat from the blast.

- (b) Fires and explosions.

There were no fires or explosions on the vessel.

- (c) Shock.

There were no effects of shock found in electrical equipment.

- (d) Pressure.

There were no effects of pressure found in electrical equipment.

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

The scorching of painted surfaces by the radiant heat of the bomb is the only effect apparently peculiar to the atom bomb.

III. Effects of Damage.

- (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 due to electrical damage.

- (d) Effect on personnel and habitability.

None due to electrical damage.

- (e) Total effect on fighting efficiency.

None due to electrical damage.

IV. General Summary of Observers' Impressions and Conclusions.

The vessel was very slightly affected by the blast. There was no damage. The lack of general damage indicate that no assumption as to the ruggedness of electrical equipment may be made based on the performance here.

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

None.

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DETAILED DESCRIPTION OF ELECTRICAL DAMAGE

A. General Description of Electrical Damage.

(a) Overall condition.

The condition of the electrical equipment was unchanged.

(b) Areas of major damage.

There was no damage.

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

There was no damage.

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

1. Ship's service generator plant - no change.
2. Engine and boiler auxiliaries - no change.
3. Electrical propulsion - none aboard.
4. Communications - no change.
5. Fire control circuits - no change.
6. Ventilation - no change.
7. Lighting - no change.

(e) Types of equipment most affected.

There was no effect on any equipment.

B. Electric Propulsion Rotating Equipment.

This item does not apply to the vessel.

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C. Electric Propulsion Control Equipment.

This item does not apply to the vessel.

D. Generators - Ships Service.

Both generators were examined following the test and no damage was found. Both machines were used to supply normal power following the test.

E. Generators - Emergency.

No damage to the one machine was found on inspection. The unit supplied power satisfactorily for about two hours upon the return of the ship's force following the test.

F. Switchboards, Distribution and Transfer Panels.

The ship's distribution board was inspected and energized. Approximately one-third of the circuits were given insulation resistance tests at the board and were satisfactory. All distribution panels were examined. No damage was found in any unit.

G. Wiring, Wiring Equipment and Wireways.

A complete inspection of the ship revealed no damage to any wire, wireway or wiring equipment.

H. Transformers.

All transformers on the vessel were inspected and opened following the test. No damage was found in any unit.

I. Submarine Propelling Batteries.

This item does not apply to this vessel.

J. Portable Batteries.

No portable batteries were damaged or displaced by the able blast. Diesel starting and gyro battery banks were equipped

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USS CONYNGHAM (DD371)

with hold down bars, but batteries in the battery shop had no retaining devices.

K. Motors, Motor Generator Sets and Motor Controllers.

No machines or controllers were damaged by the test.

L. Lighting Equipment.

No lamps, lighting fixtures or other lighting equipment were damaged by the blast.

M. Searchlights.

The 36" searchlight was tested for remote and local control operation, and the 12" signal searchlights were operated following Test A. No damage was found in any searchlight.

N. Degaussing Equipment.

The degaussing controls showed no damage and the system operated satisfactorily. Type "K" compass compensating coils on the steering and standard compasses showed no visible damage.

O. Gyro Compass Equipment.

No damage to any gyro equipment was found by inspection. The master gyro settled on the meridian in normal time and all repeaters followed properly.

P. Sound Powered Telephones.

No sound powered telephone equipment was found damaged. The system functioned properly during underway operations.

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Q. Ship's Service Telephones.

There are no telephones other than sound powered telephones on the vessel.

R. Announcing Systems.

The 1MC and 21MC announcing systems showed no damage after the test. All speakers operated satisfactorily.

S. Telegraphs.

The engine order telegraph and the steering telegraph were undamaged.

T. Indicating Systems.

There was no damage to indicating ~~systems.~~

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

The combined I.C. and A.C.O. switchboard was inspected after the A test. The board was operated on test. No damage was found.

V. F.C. Switchboard.

The F.C. switchboard was examined and all circuits tested after the A test. No damage was found.

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SECTION IV

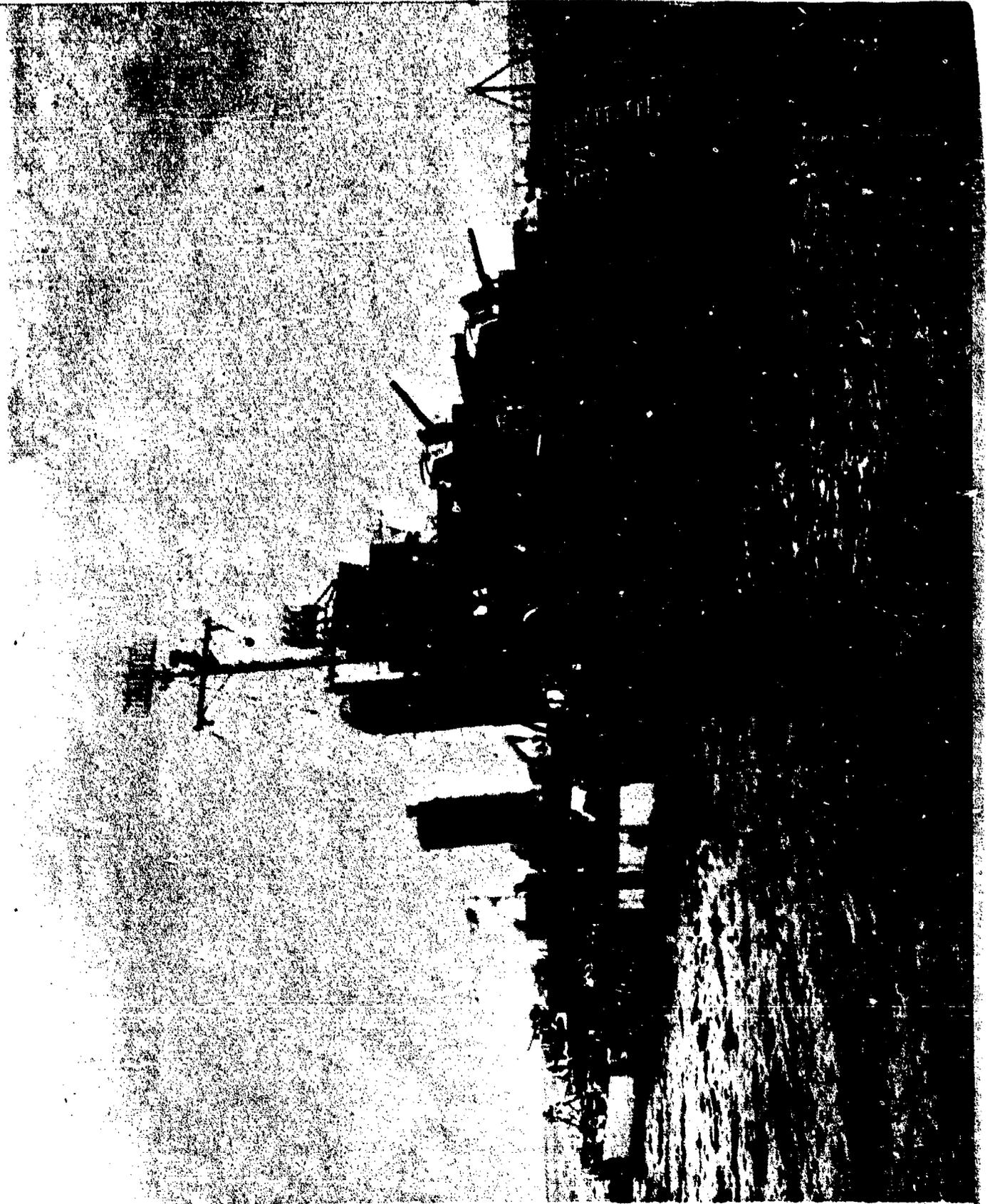
PHOTOGRAPHS

TEST ABLE

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AA-CR-227-87-59. View from off starboard bow. (Spotting and re-painting of shell started.

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AA-CR-227-87-56. View from off port quarter. (Repainting of shell started.)

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AA-CR-65-1727-3. Paint scorching on after quartering bulkhead of deck house, frames 156-159, starboard. Paint scorching is only one coat, the outer, deep.

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APPENDIX

COMMANDING OFFICERS REPORT

TEST ABLE

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SECTION III

PART A - GENERAL SUMMARY

I. Target condition after test was excellent. No noticeable change in any material. Personnel topside not wearing protective clothing would have received some flash burn.

II. Forces Evidenced and Effects Noted.

Forces evident and effects noted were a slight scorching of paint, but only on those surfaces normal to about thirty degrees on the starboard quarter. There was apparently no shock, but some soot was backed down the stack into the fireroom, and lint and dust were forced back into some spaces through the exhaust vents.

III. Results of Test on Target.

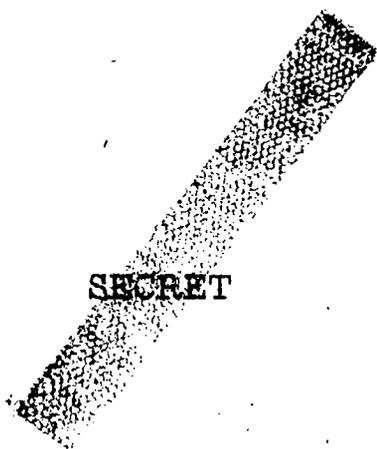
The test had no effect on the material of the ship other than the scorching as previously noted. However, it probably would have had considerable effect on exposed personnel, both physically and psychologically; the fighting efficiency would have been proportionately reduced.

IV. General Summary.

No comment.

V. Preliminary Recommendations.

No comment.


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USS CONYNGHAM (DD371)



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

TRC

9 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:

+ ST-A

AD-366748 -	XRD-65
AD-366747 ~	XRD-64
AD-366746 ^	XRD-63
AD-376826 ~	XRD-60
AD-376824 ~	XRD-58
AD-376825 -	XRD-59
AD-376823 -	XRD-57
AD-376822 -	XRD-56
AD-376821 ~	XRD-55
AD-366743 ~	XRD-54
AD-376820 ~	XRD-53
AD-366742 ~	XRD-52
AD-366741 ~	XRD-51
AD-366740 -	XRD-50-Volume-2
AD-366739 -	XRD-49-Volume-1
AD-366738 -	XRD-48
AD-366737	XRD-47

TRC

9 April 1997

SUBJECT: Declassification of Reports

AD-366736 -	XRD-46
AD-366735 -	XRD-45
AD-366723 -	XRD-37
AD-366721 -	XRD-35
AD-366717 -	XRD-31-Volume-2
AD-366716 -	XRD-30-Volume-1
AD-366751 -	XRD-68-Volume-2
AD-366750 -	XRD-67-Volume-1
AD-366752 -	XRD-69
AD-366744 -	XRD-61.

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

Arduith Jarrett
ARDITH JARRETT
Chief, Technical Resource Center

*Completed
1 mar 2000
B.W.*