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BUREAU OF SHIPS GROUP

TECHNICAL INSPECTION REPORT

OVERALL SUMMARIES OF TARGET VESSELS

TEST BAKER

VOLUME 2 OF 2

CONFIDENTIAL
Security Information

OPERATION CROSSROADS

DIRECTOR OF SHIP MATERIAL

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(9) BUREAU OF SHIPS GROUP

TECHNICAL INSPECTION REPORT.

(6) OPERATION CROSSROADS

OVERALL SUMMARIES OF TARGET VESSELS.

TEST BAKER.

VOLUME 2 of 2

U. S. GOVERNMENT [illegible] REPORT DIRECTLY
FROM DDC. OTHER [illegible] THROUGH

[illegible] Atomic Support Agency
Washington, D. C. 20301

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Captain, U.S.N.

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INTRODUCTION

The report of damage on each target vessel contains an Overall Summary of damage for that vessel. In addition, for convenience and ready reference all Overall Summaries for Test Baker have been bound in two volumes.

This volume, Volume 2 of 2 contains the Summaries of the following vessels:

(a) Transports.

(b) Landing Craft.

(c) Concrete Craft.

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TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

There was some minor, harmless flooding from normal leakage and from decontamination wash water.

(b) Structural damage.

HULL

The ship suffered no apparent structural damage. The temporary upper deck covers, which were installed after Test A over both cargo holds, fell into the spaces below. The covers were made of two by four inch framing covered with canvas.

A steel fragment, apparently from the LSM 60, pierced the superstructure deck at frame 150, starboard.

MACHINERY

Superstructure, hull, interior of hull, above and below armored deck (if fitted).

No comment.

ELECTRICAL

Not observed.

(c) Other damage.

HULL

Not observed.

MACHINERY

The machinery was not damaged, insofar as could be determined by visual inspection.

ELECTRICAL

No electrical equipment was damaged.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

No evidence.

MACHINERY

Not evidenced.

ELECTRICAL

No effects of heat were found on the vessel.

(b) Fires and explosions.

HULL

None.

MACHINERY

Not evidenced.

ELECTRICAL

There were no fires and no explosions on the vessel.

(c) Shock.

HULL

There were mild indications of shock. In the forward engineroom, frame 69, asbestos insulation was broken loose from a four-inch boiler feed pipe. However, china dishes in the same space were not displaced from such places as flanges of horizontal I-beams.

MACHINERY

Not evidenced.

ELECTRICAL

No evidence of shock was found in any electrical equipment.

(d) Pressure.

HULL

None.

MACHINERY

Not evidenced.

ELECTRICAL

No effects of pressure were found in any electrical equipment.

(e) Effects peculiar to the Atomic Bomb.

HULL

The only effects noted peculiar to the test are radioactivity and wave phenomena.

MACHINERY

None.

ELECTRICAL

No effects peculiar to the Atom bomb were found in any electrical equipment. The high radioactivity on the vessel was the only effect noted as being peculiar to the atom bomb.

III. Results of Test on Target.

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

HULL

None.

MACHINERY

None.

ELECTRICAL

None due to electrical damage.

(b) Effect on gunnery and fire control.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None due to electrical damage.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No effect due to electrical damage.

(d) Effect on personnel and habitability.

HULL

Except for the effects of radioactivity, it is considered that personnel and habitability would not have been affected by the test.

MACHINERY

Test B had no effect on personnel or habitability except for the effect of radioactivity, which was high 15 days after Test B.

ELECTRICAL

No effect due to electrical damage.

(e) Effect on fighting efficiency.

HULL

The longitudinal strength, buoyancy, stability, watertight integrity, and the seaworthiness of the vessel and the operability of machinery and the hull were not affected by the test.

MACHINERY

Insofar as machinery is concerned, the test had no effect on fighting efficiency.

ELECTRICAL

No effect due to electrical damage.

IV. Summary of Observers' Impressions and Conclusions.

HULL

Except for the radiological phenomena experienced, this vessel was beyond the range of effectiveness of the bomb.

MACHINERY

The BANNER was beyond the effective range of the explosion except for the effect of radioactivity.

ELECTRICAL

No electrical damage was found on inspection and although operation was impossible, there is no reason to suspect any damage. No damage of any kind was noted during staff electrical inspection. The high radioactivity on the vessel is the only effect resulting from the BAKER atom bomb test. This vessel together with other vessels, emphasizes radioactivity as a major problem.

V. Preliminary Recommendations.

HULL

No comment.

MACHINERY

None.

ELECTRICAL

As there was no electrical damage, no recommendations are made.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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.

HULL

There is no structural damage.

MACHINERY

No comment.

ELECTRICAL

No structural damage observed which affected electrical equipment.

(c) Other damage.

HULL

Not observed.

MACHINERY

None.

ELECTRICAL

No electrical damage was observed as a result of test B.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of fires or explosions.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock on electrical equipment.

(d) Pressure.

HULL

Only upper deck cargo hatch boards were displaced. One board of the after hatch and 60 per cent of the boards of the forward hatch have fallen to the main deck level. Although there is little indication other than the displacement of the hatch boards, the ship probably took onboard a large amount of water.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure on electrical equipment.

(e) Effects peculiar to the atomic bomb.

HULL

The ship took on board some radioactive water, and has various degrees of radioactivity throughout the ship which limited the time for inspections.

MACHINERY

None, except radioactivity.

ELECTRICAL

There were no effects noted that are considered peculiar to the atomic bomb other than radioactivity.

III. Results of Test on Target.

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

HULL

No units could be run, but in the opinion of the inspecting party, there should be no change in operability as a result of the test.

MACHINERY

None, as far as can be determined by visual inspection. No machinery on this vessel was operated after test B because of radioactivity, which was high when the ship was inspected 15 days after the test.

ELECTRICAL

Although operability tests were not made, no evidence could be found that electrical equipment or ship control were affected by this test.

(b) Effect on gunnery and fire control.

HULL

No apparent damage to equipment.

MACHINERY

No comment.

ELECTRICAL

Gunnery and fire control were unaffected electrically.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

No effect other than radiological hazards.

MACHINERY

None, except for possible effects of radioactivity.

ELECTRICAL

It is considered the only effect on personnel and habitability would have been that due to radioactivity.

(e) Effect on fighting efficiency.

HULL

No effect other than radiological hazards.

MACHINERY

None, except for possible effects of radioactivity. As the machinery was fully operable, the vessel might have been able to steam out of the contaminated area without being seriously affected.

ELECTRICAL

There was no effect on the fighting efficiency of this vessel as a result of this test from electrical failures. It is considered that except for personnel casualties due to radioactivity this vessel fighting efficiency would have been unimpaired.

IV. Summary of Observers' Impressions and Conclusions.

HULL

There is no apparent effect on the ship either structurally or in displacement of fittings or equipment within compartments. Except for radiological considerations, the ship was subjected to no worse conditions than would be met in heavy seas.

MACHINERY

The BARROW was outside the effective range of physical damage from the explosion during test B.

ELECTRICAL

The distance of this vessel from the blast was too great for electrical damage to occur.

V. Preliminary Recommendations.

HULL

Securing arrangements for upper deck cargo hatch boards should be more positive.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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.

HULL

This vessel suffered no serious structural damage. The hatch battens on both upper deck cargo hatches were loosened. Three or four panels of the upper deck covers were dislodged and fell to the main deck level. An athwartships canvas awning at the after end of the 03 deck tore loose from the securing lashing inboard and bent the 1-3/4 inch standard pipe stanchions at the outboard corner.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Other damage.

HULL

Not observed.

MACHINERY

A water column sight glass on #1 main condenser was broken.

ELECTRICAL

The main electric plant, ship propulsion and electrical elements of ship control, fire control and gunnery were undamaged and operated satisfactory.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

No evidence of heat was discovered.

MACHINERY

Not evidenced.

ELECTRICAL

None evidenced.

(b) Fires and explosions.

HULL

No fires or explosions occurred.

MACHINERY

Not evidenced.

ELECTRICAL

None evidenced.

(c) Shock.

HULL

The only evidence of shock is the slight derangement of hatch covers.

MACHINERY

A water column sight glass on #1 main condenser was broken, indicating that the ship received a slight underwater shock.

ELECTRICAL

None evidenced.

(d) Pressure.

HULL

The only evidence of pressure is the tearing loose of a canvas awning on the after end of the 03 deck.

MACHINERY

Not evidenced.

ELECTRICAL

The only evidence of pressure was the lifting of the cargo hatch pontoons, apparently due to negative blast pressure. There was no damage to any electrical equipment.

(e) Effects peculiar to the Atom Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

Radioactivity was the only effect noted apparently peculiar to the Atom Bomb.

III. Results of Test on Target.

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

HULL

Operability was not affected. All machinery has been operated since the test.

MACHINERY

The test had no effect on machinery and ship control. Breakage of the water column sight glass on #1 main condenser would not have affected operation.

ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

It is considered that there would have been no casualties.

MACHINERY

None.

ELECTRICAL

1. Other than the effects of radioactivity, personnel on topside would probably have suffered injuries from blast pressure waves to the extent of a few bruises.

2. Habitability has in no way been affected.

(e) Effect on fighting efficiency.

HULL

The longitudinal strength, buoyancy, stability, watertight integrity, and seaworthiness of the vessel and the operability of equipment and machinery were not affected by the test.

MACHINERY

None.

ELECTRICAL

The fighting efficiency of this vessel has in no way been affected as a result of any material damage.

IV. Summary of Observers' Impressions and Conclusions.

HULL

The effect on the ship was negligible.

MACHINERY

The BLADEN was beyond the effective range of the explosion in Test B. No radioactivity was found on this vessel.

ELECTRICAL

The location of this vessel in the target array was outside the effective range of the bomb to cause any material damage.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

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

There was a small amount of water in forward hold and forward machinery space due to water entering vents from fire hoses of salvage tugs engaged in decontamination work. There was some water in the shaft alley bilges due to normal stern tube leakage.

(b) Structural damage.

HULL

No damage except for a hole punched in the side of the ship by a tug.

MACHINERY

No comment.

ELECTRICAL

There was no structural damage as a direct result of the bomb. A hole about 6'' x 36'' was punched in port side at frame 105 by salvage tug coming alongside.

(c) Other damage.

HULL

Not observed.

MACHINERY

No damage was found by a careful visual inspection of all machinery. No machinery was operated because of radiological hazard.

ELECTRICAL

Close visual inspection revealed no damage to any electrical equipment, or electrical elements of ship control, fire control and gunnery.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None.

(c) Shock.

HULL

Slight shock effect is noted in the shaking down of asbestos pipe insulation in the forward and after machinery space.

MACHINERY

No evidence.

ELECTRICAL

1. Slight shock was evidenced throughout the vessel by shakedown of dirt from inaccessible places and vent ducts and in machinery spaces by asbestos pipe insulation being loosened and dislodged.

2. There was no electrical damage as a result of shock.

(d) Pressure.

HULL

About 25 percent of the hatch boards of both upper-deck cargo hatches were dislodged and fell to the main deck.

MACHINERY

No evidence.

ELECTRICAL

1. Negative pressure is indicated by the lifting of approximately 25% of the hatch boards on forward and after cargo holds and positive pressure by soot blown from furnace registers in both engine rooms.

2. There was no electrical damage as a result of pressure.

(e) Effects peculiar to the atom bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

None, other than radioactivity.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

None.

ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Except for the effects of radioactivity, it is considered that personnel and habitability would not have been affected.

MACHINERY

None except radioactivity, which was high when the ship was inspected 16 days after Test B.

ELECTRICAL

Personnel and habitability has not been affected except for possible adverse effect of radiation.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None, except radioactivity.

ELECTRICAL

None from a material standpoint.

IV. General Summary.

HULL

No comment.

MACHINERY

The BRACKEN was beyond the effective range of the explosion of Test B, as far as mechanical damage is concerned.

ELECTRICAL

The position of this ship in the target array was outside the effective radius of the bomb. Although subjected to minor shock and pressure waves, these were not sufficient to cause any material damage and the vessel appears to be sound in every respect.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

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

In the superstructure, bulkheads are dished, both flag bags are missing, watertight and weathertight doors are dished. Some of the doors are jammed. The stacks are also dished. The upper deck cargo hatch boards are displaced. Many of the boards are creased at the mid length. The retaining straps for both port and starboard after cargo booms have been carried away.

MACHINERY

No comment.

ELECTRICAL

Not observed.

(c) Other Damage.

HULL

Not observed.

MACHINERY

Cracked paint around the foundations of the ship's service (AC) and auxiliary (DC) generator in the forward engine room indicates slight momentary displacement of these units. Three hold-ing down bolts on the auxiliary condenser in the auxiliary machinery

room sheared. Mounting bolts securing vertical reciprocating pumps were loosened on practically all of these pumps. On this vessel, almost all pumps are of this type. Brickwork of #2 boiler was slightly damaged. A cast aluminum link in the flexible coupling of the emergency diesel generator broke. There was some other minor damage.

NOTE: It was not practicable to test machinery or to open it for interior inspection. The only machinery on this vessel operated after Test B is the emergency diesel generator. It is considered probable that there are leaks in some of the auxiliary condensers and some other damage may exist.

ELECTRICAL

The only positive electrical damage included the gyro compass, portable storage batteries, and scattered lighting fixtures.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat.

(b) Fires and Explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There were no fires or explosions.

(c) Shock.

HULL

The only evidence of damage that might possibly be attributed to shock, is the large number of broken electric light bulbs throughout the ship.

MACHINERY

The BRISCOE received a fairly heavy underwater shock which caused most of the damage listed above. There are also other evidences of shock such as galley range tops thrown around the broken, loose gear scattered around, etc.

ELECTRICAL

There were indications of shock in the engineering spaces, as evidenced by cracked paint and missing hold down bolts on heavy machinery in both engine rooms and auxiliary machinery spaces.

(d) Pressure.

HULL

There is little effect of pressure as such. Structural damage is believed to have been caused by shipping of green water due to a wave created by the blast. The ship's inclinometer indicates a roll to starboard in the general order of 60 degrees and a roll of approximately 55 degrees to port.

MACHINERY

No evidence.

ELECTRICAL

No evidence of pressure was observed.

(e) Effects peculiar to the Atomic Bomb.

HULL

Effects peculiar to the atomic bomb are the downfall of water and a large wave of water.

MACHINERY

An underwater shock of this magnitude at such a distance from an explosion is apparently peculiar to the Atom Bomb.

ELECTRICAL

High radioactivity which presisted after the test was the only peculiar effect noted.

III. Effects of Damage.

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

HULL

Not observed.

MACHINERY

Damage found by visual inspection had no appreciable effect on machinery or ship control. Breakage of the link in the flexible coupling of the emergency diesel generator did not impair operation as the generator was operated to furnish lighting current during the inspection. Additional damage such as condenser tube leaks may exist. Some additional damage might have occurred if the machinery had been operating. However, it is not believed that such additional damage would be sufficient to immobilize the ship or to seriously handicap her for more than a short time.

ELECTRICAL

It is believed propulsion and ship control was not seriously affected.

(b) Effect on gunnery and fire control.

Not observed.

MACHINERY

No comment.

ELECTRICAL

Not affected by electrical failures.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

Not affected.

(d) Effect on personnel and habitability.

HULL

Personnel would have been endangered by the equipment being dislodged and thrown about the ship due to the excessive rolling. Top side personnel would have had difficulty remaining in exposed position. Heavy rolling of the ship, coupled with the heavy downpour of water fromthe bomb, would have washed many of the personnel overboard. Habitability of the ship is adversely affected because of the radiological condition.

MACHINERY

The ship had high radioactivity when inspected 16 days after Test B. This would have had little effect on personnel or habitability below decks.

ELECTRICAL

Personnel and habitability were not affected by any electrical failures.

(e) Effect on fighting efficiency.

HULL

The fighting efficiency of the vessel would probably have been adversely affected by injuries to personnel.

MACHINERY

Damage found by visual inspection would have had no effect on fighting efficiency. It is not believed that fighting efficiency would have been seriously affected mechanically if she had been underway during the test. The effect of radioactivity might have had a serious effect on fighting efficiency .

ELECTRICAL

None due to electrical failures.

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

HULL

Structurally, this vessel could carry out its function but, other considerations such as personnel injuries would probably handicap its efficiency.

MACHINERY

The BRISCOE appears to have been at approximately the limiting range of effectiveness of this type of attack against vessels of her class.

ELECTRICAL

It is believed that the vessel received the maximum amount of shock without suffering major damage. If the vessel had been a few yards closer to the blast it is thought that some of her heavy machinery would have carried away from its foundations.

V. Preliminary General or Specific Recommendations of Inspection Group.

HULL

None.

MACHINERY

The casulaty to the flexible coupling of the emergency diesel generator indicates that use of cast aluminum in naval machinery should be discontinued.

This vessel's experience is an outstanding example of the fact that the radiological hazard is the most serious danger from this form of attack.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

Drafts were as follows:	Forward	Aft	List
Before Test B	9' - 8"	15'- 10"	0
After Test B	10' - 0"	16'- 6"	2° Port

The Forward Machinery Space has flooded to the waterline through a broken 3/4 inch nipple on the auxiliary condenser blowdown connection. The injection and overboard valves of this condenser were open during the test. The flooding could have been controlled if the crew had been aboard. The port shaft alley is about 65 percent flooded. The starboard shaft alley is about 45 percent flooded. This is considered to be the accumulation of water due to normal stern tube leakage during the time the ship was inactive.

(b) Structural damage.

HULL

No damage to the shell plating or to the structure in interior spaces was observed, although there apparently has been slight elastic deflection of the upper deck. There has been some dishing of exposed longitudinal bulkheads above the main deck on the port sides only: the maindeck passageway bulkhead is dished a maximum of 3 inches and all doors are dished; the upper deck bulkheads are dished a maximum of 1/2 inch; the double doors to the carpenter shop are dished 8 inches; the navigating deck bulkheads are dished a maximum of 1 inch. Nearly all of the upper deck cover panels of both cargo hatches have been dislodged and pushed into the space below.

One main deck pontoon cover section of each hatch has been dislodged and has fallen into the hold. Two strongbacks at the upper deck level of the forward cargo hatch were pushed down to the main deck level. Interior joiner work and furniture which was previously disarranged by Test A is somewhat further disarranged. During Test B all access closures were closed.

MACHINERY

No comment.

ELECTRICAL

Structural damage involving electrical equipment was negligible. A few floor plates under the propulsion control units were dislodged and thrown against the control cables.

(c) Other damage.

HULL

No comment.

MACHINERY

Machinery in the forward engine room was damaged by flooding. Holding down bolts were loosened on condenser and refrigeration equipment. Electric drinking foundations throughout the ship and a considerable number of small salt water lines (already weakened by corrosion), were broken. There is some other scattered minor damage.

ELECTRICAL

Damage to electrical equipment consisted essentially of the following:

1. Equipment on the lower level of the forward engine room was flooded.

2. The master gyro compass suspension springs were stretched.

3. Storage batteries in I.C. room were dislodged.

4. Holding down bolts on ship's service generators and bolts on exciter end bells showed signs of being stretched.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

No evidence.

MACHINERY

No evidence.

ELECTRICAL

No evidence.

(b) Fires and explosions.

HULL

No evidence.

MACHINERY

No evidence.

ELECTRICAL

No evidence.

(c) Shock.

HULL

Shock was not sufficiently severe to break mirrors or light bulbs. Relatively heavy masses on slender supports exhibited inertia effects. The curved radar plate on the fore-topmast broke off and landed on the upper deck, port, five frames forward of its original position. In the pressing room, first platform, starboard, a vertical rod supporting a relatively heavy electric switch at its upper extremity was bent to port.

Displacement of loose equipment in general is believed to have been caused by motion of the ship incident to the wave which struck the ship.

MACHINERY

This vessel received a moderately heavy underwater shock.

ELECTRICAL

Shock was apparently transmitted vertically through the hull and caused minor damage to electrical equipment. Several light bulbs were shattered. A socket in the after engine room was jarred loose. Several arc chutes in control cubicles were dislocated. Generator holding down bolts were stretched. Supporting springs for the master gyro compass were stretched. Storage batteries in the I.C. room were dislocated.

(d) Pressure.

HULL

The damage to the longitudinal bulkheads and doors on the port side above the main deck and to the distorted upper deck cargo hatch covers is the result of either air pressure or falling water.

MACHINERY

No evidence.

ELECTRICAL

No evidence.

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

HULL

No comment.

MACHINERY

An underwater shock of this magnitude is apparently peculiar to the Atom Bomb.

ELECTRICAL

There were no apparent effects peculiar to the atom bomb except the radioactivity.

III. Effects of Damage.

(a) Effect on machinery and ship control.

HULL

No comment.

MACHINERY

The forward engine room is inoperable because of flooding, but this could have been prevented if the crew had been aboard. The other damage found would have no appreciable effect on operation. However, it was impracticable to test machinery or to open it for interior inspection because of radiological hazard. Other damage (particularly condenser leaks) may exist.

ELECTRICAL

The effect of damage was to reduce the power for propulsion 50% due to inoperability of the forward main motor.

Ship control was slightly impaired due to damage to the master gyro compass.

(b) Effect on gunnery and fire control.

HULL

No comment.

MACHINERY

No comment.

ELECTRICAL

Gunnery and fire control was slightly impaired due to damage to the master gyro compass.

(c) Effect on watertight integrity and stability.

HULL

The watertight integrity of the vessel has been affected only by the fracture of the 3/4 inch nipple in the forward machinery space. Stability is not appreciably affected.

MACHINERY

No comment.

ELECTRICAL

There was no effect on watertight integrity or stability due to electrical damage.

(d) Effect on personnel and habitability.

HULL

Except for the effects of radioactivity, it is considered that personnel and habitability would have been but slightly affected by the test.

MACHINERY

Damage to electric drinking fountains adversely affected habitability. Otherwise, it is not believed that personnel below decks or habitability would have been affected by the test except for radioactivity. The latter was very high when the ship was inspected 25 days after Test B.

ELECTRICAL

The effect of electrical damage on personnel and habitability was negligible.

(e) Total effect on fighting efficiency.

HULL

The longitudinal strength, buoyance, stability, watertight integrity, and seaworthiness of the vessel and the operability of equipment and machinery were not appreciably affected by the test. Although the fracture of a 3/4 inch nipple permitted leakage which flooded the forward machinery space, it is considered that this damage could have been quickly located and repaired without appreciable loss of fighting efficiency of a manned and operating ship.

MACHINERY

Doubtful. If the crew had been aboard, flooding could have been controlled. In this case, fighting efficiency would have been affected little or none insofar as can be determined by visual inspection. Additional damage may exist. It is not believed that this is sufficient to seriously affect the ship's military efficiency.

ELECTRICAL

The fighting efficiency of the vessel was seriously reduced due to a 50% reduction in propulsion power. This is a secondary effect caused by controllable flooding.

IV. General Summary of Observers' Impressions and Conclusions.

This vessel suffered no major structural damage. However, it was at a distance from the explosion at which damage from both pressure and shock is evident.

MACHINERY

The BRULE appears to have been near the limited range for serious mechanical damage from an attack of this nature on this type of vessel.

ELECTRICAL

All electrical damage vital to the operation of the vessel was caused by very slow flooding which could have been prevented had any of the crew been available in the engine room. Except for the above flooding and for damage to the master gyro compass, electrical damage would not have appreciably affected the operation of the vessel and could easily have been repaired by the ship's force.

V. Preliminary General or Specific Recommendations of Inspecting Group.

HULL

None.

MACHINERY

It is recommended that the design of pipe fittings be studied with a view to making them more resistant to shock. It is also recommended that salt water piping be made more resistant to corrosion perhaps by using copper nickel for this service.

ELECTRICAL

More adequate holding down bolts should be provided for the ship's service generator sets, especially the 100 K.W. sets.

Floor plates and other enclosing members of control cubicles and switchboards should be adequately secured.

Arc chutes for electrical contactors should be secured against shock. The securing measures should not depend upon gravity to hold the chute in place.

The securing means for storage batteries should be such that jars and plates are held in place and such that the probability of careless non-use is minimized.

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

There is no apparent structural damage. A fragment pierced the upper deck at frame 150, starboard.

MACHINERY

No comment.

ELECTRICAL

No structural damage observed which affected electrical equipment.

(c) Other damage.

HULL

Not observed.

MACHINERY

The machinery of this vessel was not damaged by Test B, so far as can be determined by visual inspection.

ELECTRICAL

No electrical damage was observed as a result of Test B.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of fires or explosions.

(c) Shock.

HULL

None.

MACHINERY

Leads left in the bearings of one main turbo-generator and one ship's service generator during the test indicate very slight motion of the rotors. This indicates that the BUTTE received a slight underwater shock.

ELECTRICAL

There was no evidence of shock on electrical equipment.

(d) Pressure.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure on electrical equipment.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None, except radioactivity.

ELECTRICAL

There was no effects noted that are considered peculiar to the atomic bomb other than radioactivity.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

None, as far as can be determined by visual inspection. No machinery except the emergency diesel generator and diesel fire pump were operated on this vessel after Test B, because of radiological hazard. Radioactivity was moderately high topside and was present in the machinery spaces in a few isolated spots, all near the shell of the ship, when she was inspected 15 days after the test.

ELECTRICAL

Although operability tests were not made, no evidence could be found that electrical equipment or ship control were affected by this test.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

Gunnery and fire control were unaffected, electrically.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None, except radioactivity.

ELECTRICAL

It is considered the only effect on personnel and habitability would have been that due to radioactivity.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None, except radioactivity. It should be noted that the boats, stowed inboard of the davits, had much higher radioactivity than any

other place on the ship. In view of the ship's mission as a transport, this might have a serious effect on her fighting efficiency. As all machinery was fully operable, she could presumably have steamed out of the contaminated area without being seriously affected by radioactivity in water around the ship. This, however, would not affect the radioactivity topside, as in the boats, which came from the water thrown upon the vessel by the explosion.

ELECTRICAL

There was no effect on the fighting efficiency of this vessel as a result of test B from electrical failures. It is considered that except for personnel casualties due to radioactivity, this vessel's fighting efficiency would have been unimpaired.

IV. General Summary.

HULL

No comment.

MACHINERY

The BUTTE was outside the effective range of physical damage from the explosion in Test B.

ELECTRICAL

The distance of this vessel from the blast was too great for electrical damage to occur.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

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

(b) Structural damage.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Other damage.

HULL

None.

MACHINERY

There was no damage to machinery of this vessel, nearly all of which has been operated satisfactorily since Test B.

ELECTRICAL

The main electric plant, ship propulsion and elec-

trical elements of ship control, fire control and gunnery were unaffected and remained operable.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None evidenced.

(b) Fires and Explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None evidenced.

(c) Shock.

HULL

There is no definite indication of shock other than the displacement of about six hatch battens from each cargo hatch

in the upper deck.

MACHINERY

No evidence.

ELECTRICAL

There was an indication of slight shock evidenced by loosening of cargo hatch cover battens. The electrical equipment remained undamaged as a result of shock.

(d) Pressure.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None evidenced.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None, except radioactivity.

ELECTRICAL

None, other than radioactivity and wave phenomena.

III. Results of Test on Target.

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

HULL

None.

MACHINERY

The test had no effect on machinery or ship control except for possible effects of radioactivity in sea water drawn into the piping. As the ship could have steamed out of the area of contaminated water in a few minutes, it is not believed that the test would have affected her machinery if she had been underway.

ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

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

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Except for the effects of radioactivity, it is considered that personnel and habitability would not have been affected by the test.

MACHINERY

Except for possible effects of radioactivity, the test had no effect on personnel or habitability below decks.

ELECTRICAL

None, other than radioactivity.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

There was no material damage to electrical equipment which would impair the fighting efficiency of this vessel.

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

The material condition of this vessel is such as to indicate it's position in the target array was outside the effective radius of the bomb. There is no evidence of any unusual forces except for falling water on topside.

V. Preliminary recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

Before Test	Draft Forward 9' 10"	Draft Aft	17' 1"	List 0°
After Test	Forward 10' 0"	Aft	18' 0"	1/2° port

The shaft alley bilges and starboard shaft alley were flooded through the stern tubes. The after machinery space flooded from the starboard shaft alley through the bulkhead gland. The forward machinery space flooded through a broken 1/2" salt water cooling line to the main circulator lube oil cooler. The auxiliary machinery space flooded to a depth of about six feet through the starboard shaft gland from the forward machinery space.

(b) Structural damage.

HULL

No structural damage was observed.

MACHINERY

No comment.

ELECTRICAL

Not observed.

(c) Other damage.

HULL

Not observed.

MACHINERY

Machinery in the forward engine room and auxiliary machinery room was damaged by flooding. No other damage to machinery was found by a careful visual inspection.

ELECTRICAL

Flooding of equipment in the two machinery spaces was the only damage sustained by electrical equipment.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

No effects of heat were noted.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There were no fires nor explosions on the vessel.

(c) Shock.

HULL

Slight shock effect is indicated by shaking down of asbestos pipe insulation in the after machinery space. About 65% of the weather deck cargo hatch cover battens forward and 95% aft are dislodged. Two pontoon covers on the main deck cargo hatch are dislodged. No hatch battens or pontoons are damaged. This disarrangement may have been caused by rapid rolling of the ship.

MACHINERY

The CATRON received a moderate underwater shock which broke a small salt water cooling line in the forward engine room.

ELECTRICAL

No effects of shock were found in any electrical equipment.

(d) Pressure.

HULL

No effects noted.

MACHINERY

No evidence.

ELECTRICAL

No effects of pressure were noted in any electrical equipment.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

An underwater shock of such magnitude as to cause damage at so great a distance from an explosion is apparently peculiar to the Atom Bomb.

ELECTRICAL

No effects, other than the high radioactivity, were found as bein peculiar to the Atom Bomb.

III. Results of Test on Target.

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

HULL

No comment.

MACHINERY

All machinery in the forward engine room and auxiliary machinery room is inoperable because of flooding. This could have been easily controlled if the crew had been aboard. In this case, it is not believed that the test would have had any effect on machinery or ship control. The steering gear is apparently undamaged.
NOTE: No machinery on this vessel was operated after Test A.

ELECTRICAL

Half of the electric propulsion would be lost through the flooding of the forward main motor and forward auxiliaries. Ship control would not be affected.

(b) Effect on gunnery and fire control.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

There would be no effect on gunnery and fire control due to electrical damage.

(c) Effect on watertight integrity and stability.

HULL

Flooding occurred because of failure of a badly corroded salt water line and a leaky stern tube. This condition could have been corrected and the extensive flooding prevented had the ship been manned.

MACHINERY

No comment.

ELECTRICAL

There would be no effect on watertight integrity nor on stability due to electrical damage.

(d) Effect on personnel and habitability.

HULL

Except for the effects of radioactivity, it is considered that personnel and habitability would not have been affected by the test.

MACHINERY

It is not believed that the test would have had any effect on personnel or habitability except for possible effects of radioactivity.

ELECTRICAL

Electrical damage would have had no effect on personnel. The habitability of the ship would have been reduced by the flooding out of all evaporator pump motors.

(e) Effects on fighting efficiency.

HULL

Flooding of some engineering spaces reduced the fighting efficiency considerably but this would have been prevented had the ship been manned.

MACHINERY

The flooding reduced maximum speed to about 6 knots and left the ship without an evaporating plant. If the crew had been aboard, the flooding could have been easily controlled and the test would have had no effect on military efficiency as far as machinery is concerned.

ELECTRICAL

The fighting efficiency of the ship would have been greatly reduced due to the loss of one propulsion motor and auxiliaries.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

The CATRON was outside the effective range of serious mechanical damage from this form of attack in Test B.

ELECTRICAL

The damage as found would have limited the effectiveness of

the ship due to the loss of half of the propulsion. Had a ship's force been aboard at the time of the blast, the flooding would have been controlled and no damage to electrical shipment would have occurred.

The inspection furnishing the material for this report was made very quickly due to high radioactivity.

V. Preliminary Recommendation.

HULL

None.

MACHINERY

None.

ELECTRICAL

Although flooding of electrical gear occurred, the flooding would have been controlled under normal conditions; and therefore no recommendations are warranted.

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

None.

MACHINERY

No comment.

ELECTRICAL

No structural damage was observed which affected electrical equipment.

(c) Other damage.

HULL

No comment.

MACHINERY

There was no damage to machinery of this vessel during Test B.

ELECTRICAL

No electrical damage occurred as a result of Test B.

II. Forces Evidenced and Effects Noted.

(a) Heat

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of fires or explosions.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock on electrical equipment.

(d) Pressure.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure on electrical equipment.

(e) Effects apparently peculiar to the Atom Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

There were no effects noted that are considered peculiar to the Atomic Bomb other than radioactivity.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

None.

ELECTRICAL

All electrical equipment was operable and ships control was unaffected.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment

No comment

ELECTRICAL

Gunnery and fire control were unaffected electrically.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None.

ELECTRICAL

It is considered the only effect on personnel and habitability would have been that due to radioactivity. The extent of such effects are unknown.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

There was no effect on the fighting efficiency of this vessel as a result of Test B from electrical failures. It is considered that, except for possible personnel casualties due to radioactivity, this vessel's fighting efficiency would have been unimpaired.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

The CORTLAND was outside the effective range of the explosion of Test B.

ELECTRICAL

The distance of this vessel from the blast was too great for electrical damage to occur.

V. Any Preliminary, General, or Specific Recommendation of the Inspection Group.

HULL

Although this ship was located on the outer fringe of the target array, hatch boards on #2 cargo hatch were dislodged. It is indicated that a more adequate method of securing these boards is required.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

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

(b) Structural damage.

HULL

There is increased deflection of the upper deck and starboard shell in way of areas previously damaged in test A. This is accompanied by increased distortion of supporting frames, stanchions, and bulkheads.

MACHINERY

No comment.

ELECTRICAL

None observed.

(c) Other damage.

HULL

Not observed.

MACHINERY

There was no damage to machinery of this vessel, insofar as could be determined from visual inspection.

ELECTRICAL

No electrical equipment appeared to be damaged as a

result of this test. Operability tests were not made on the equipment, however, no damage could be detected from visual examination.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

No effects.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of fires or explosions.

(c) Shock.

HULL

The effects of shock are slight and are difficult to distinguish from those of heavy rolling. An anvil is broken loose from its hold-down clips, a radio amplifier is displaced from its

stowage rack, and medical supplies are dislodged from stowages. In the machinery spaces some lagging is shaken loose and the lens of an inclinometer is broken.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock affecting electrical equipment. There was evidence that the vessel received underwater shock since loosely stowed gear was disarranged inside of the vessel. There were also a few fragments of steel on the deck which came from some source other than this vessel, possibly LSM 60. These fragments caused no damage to the electrical equipment on this vessel.

(d) Pressure.

HULL

The effects of air blast are difficult to distinguish from those of falling water and the wave which washed over the deck. The combination of these caused damage to the shell and upper deck in the forward hold area. Temporary closures of cargo hatches, ports, and access openings are demolished. The underwater hull is apparently unaffected.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure affecting electrical equipment. There was evidence that the vessel received some pressure in the form of air blast or falling water since some wooden shoring material and jury rigged hatch covers were blown off.

(e) Effects peculiar to the atomic bomb.

HULL

Effects peculiar to the atomic bomb are the violence of the explosion and radiological contamination.

MACHINERY

None.

ELECTRICAL

There were no effects noted that are considered peculiar to the atomic bomb other than radioactivity.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

None.

Note: No machinery on this vessel was operated after test B.

ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

Personnel and habitability would have been principally affected by radiological conditions. Personnel exposed topside probably would have been injured by air blast, falling water, and the inundating wave.

MACHINERY

None, except for radioactivity.

ELECTRICAL

Except for the effects of radioactivity, it is considered that personnel and habitability would not have been affected by the test.

(e) Effect on fighting efficiency.

HULL

Except for the effects of radiological contamination, the fighting efficiency of the ship is not affected appreciably.

MACHINERY

None.

ELECTRICAL

Fighting efficiency would not be affected by this test unless personnel casualties resulted from the radioactivity.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

The principal effects on a ship at this distance from an underwater burst apparently are from air blast, falling water and large waves.

MACHINERY

The CRITTENDEN was outside the effective range of the explosion in test B except for radioactivity. As she was fully operable she could probably have steamed out of the area of contaminated water without being seriously affected.

ELECTRICAL

Although there was some evidence that the vessel received underwater shock and was subjected to air blast or water pressure, there was no electrical damage as a result of this test. It is therefore concluded that this vessel was too far from the center of the blast to be damaged.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition after Test.

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

No flooding occured, hence there is no change in drafts or list.

Two inches of highly radioactive water was found in the forward hold and in the after machinery space. This water apparently came in through the forward cargo hatch and down the after stack.

(b) Structural damage.

HULL

There is no structural damage.

MACHINERY

No comment.

ELECTRICAL

None observed.

(c) Other damage.

HULL

Not observed.

MACHINERY

No damage to machinery could be found by visual inspection. Machinery of this vessel was not operated after Test B because

of radiological hazard.

ELECTRICAL

The only electrical damage to this vessel as a result of the underwater bomb explosion was the destruction of one cargo light by fragments, damaging of the anchor windlass controller master switch by fragments, and tne breaking of the voice coil leads on one announcing system reproducer.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of fires or explosions.

blast or falling water since jury rigged wooden hatch covers were blown down into the hold.

(e) Effect apparently peculiar to the Atom Bomb.

HULL

The only effect peculiar to the Atom Bomb is a high degree of radioactive contamination of topside structure.

MACHINERY

None.

ELECTRICAL

There were no effects noted that are considered peculiar to the Atomic Bomb other than radioactivity.

III. Effects of Damage.

(a) Machinery, electrical, and ship control equipment.

HULL

Not observed.

MACHINERY

None, insofar as can be determined by visual inspection.

ELECTRICAL

The effects on electrical equipment and ship control were negligible. The most serious effect was the damage to the anchor windlass control. Emergency repairs which would permit the anchor windlass to be used a few times could have been made by the ship's force within a few minutes.

(c) Shock.

HULL

Shock effect is negligible. Dislodging of a loudspeaker in the pilot house may be attributed to shock. The radar screen on the main topmast, which was knocked askew in Test A, has now fallen off. Dislodging of this screen probably is due to the combined effects of shock and rolling. No other equipment is known to have been affected by shock. Rolling is the apparent cause of overturned lockers and broken dishes in the interior.

MACHINERY

No evidence.

ELECTRICAL

The only evidence of shock observed was the displacement of 1MC announcing system reproducer from its mounting on the bulkhead in the pilot house. This shock was not considered to be very severe since the reproducer was not properly secured prior to the test. Other electrical damage was caused by the impact of fragments striking the electrical equipment.

(d) Pressure.

HULL

Temporary closures over both cargo hatches were demolished by pressure or falling water. There are no other effects of pressure.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure affecting electric equipment. There was evidence that the vessel received pressure from air

(b) Gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

Electrically, there was no effect on gunnery or fire control.

(c) Watertight integrity and stability.

HULL

No effect.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Personnel and habitability.

HULL

Personnel would have been seriously affected by radioactivity.

Habitability of the berthing spaces in way of the cargo hatches is affected by the entrance of radioactive water through the hatches. Personnel in the after machinery space would have been jeopardized by the presence of radioactive water which came down

the stack. Temporary inconvenience resulted from debris in the cargo hatch areas, broken dishes,and disarranged lockers.

MACHINERY

None, except for radioactivity.

ELECTRICAL

There would have been no effect on personnel other than possible casualties from radioactivity and possible casualties from personnel being hit by fragments. The extent of the radiological casualties is unknown, however, it is considered that casualties due to fragments would have been light. There was no effect on habitability other than radioactivity.

(e) Total effect on fighting efficiency.

HULL

Except for the effects of radioactivity, the fighting efficiency of the ship is not affected.

MACHINERY

None, except for possible effects of radioactivity.

ELECTRICAL

Providing there were no personnel casualties from radiological effects, it is considered that there would have been no effect on the fighting efficiency of the vessel.

IV. General Summary.

HULL

At the distance of this ship from an underwater atomic bomb explosion, the principal effect to be expected is that of a high

degree of radioactive contamination of topside structure.

MACHINERY

The DAWSON was outside the effective range of physical damage from the explosion in Test B.

ELECTRICAL

The damage to this vessel as a result of Test B was due principally to fragments which came from some source other than this vessel. It is considered that this vessel was too far from the center of the blast to experience serious damage in this test.

V. Preliminary Recommendations.

HULL

Personnel in exposed locations such as gunnery and fire control stations could be housed in protective shields to prevent contact with radioactive mist or water. Consideration should be given to means of quickly decontaminating topside structure.

MACHINERY

None.

ELECTRICAL

It is recommended that the use of wedge slots to hold equipment to the bulkhead be avoided since this method of mounting is apt to result in casualties due to careless tightening of mounting screws or bolts.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

HULL

Observed drafts and list:	Draft forward;	aft;	List
Before Test B.	11' 3"	17' 4"	0°
After Test B.	16' 6"	20" 0"	5° S

The vessel was beached on the day following Test B. Prior to beaching her drafts were as indicated above. The ship flooded to the waterline, which was just below the first platform level, between bulkheads 68 and 124. In addition, both shaft alleys flooded completely through broken cooling water lines and through damaged stern tube stuffing glands. The forward machinery space (frames 68 to 83) flooded through a broken rubber flexible connection in the overboard discharge from the main condenser. The main injection and overboard discharge valves in this space had been left open as part of the test. The auxiliary machinery space flooded slowly through bulkhead 83 from the forward machiner spaces. The only observed leak in bulkhead 83 is an enlarged hole around a three inch pipe line. The after machinery space flooded through a tear in the port shell plating at its connection to the tank top, in way of the buckle between frames 93 and 94. There is also leakage into this space from the starboard shaft alley through the shaft gland in bulkhead 108 and through leaking sounding tubes from the inner bottom tanks below. Cargo hold No. 2 flooded from leakage around the hatches of the port and starboard shaft alley access trunks.

The vessel is considered to be stable. The list was largely due to the shifting of concrete block ballast in the forward hold.

MACHINERY

All machinery spaces were flooded by water and fuel oil entering through the shaft glands, a broken connection to the forward main condenser, a ruptured fuel oil tank, and possibly other sources.

ELECTRICAL

Drafts and list were not noted.

Both engine rooms and auxiliary machinery space, were flooded, other flooding was not noted.

(b) Structural damage.

HULL

Structural damage on the FALLON is extremely severe. The ship apparently experience a aeries of violent hogging and sagging movements as evidenced by buckling of shell plating and decks amidships and by shear wrinkles in plating at the quarter points. In addition, the vessel appears to have a permanent transverse curvature with the midship portion moved to starboard relative to the ends. There is also evidence of a twist in the hull such that the foremast was inclined to starboard relative to the mainmast. There is no apparent damage to the masts themselves. The principal compression failure in the lower flange of the hull girder occurred at frames 93-96. The shell plating on the port side has a pronounced vertical wrinkle between frames 93-94 which starts at about the 15 foot waterline and increases in magnitude toward the bottom of the vessel. The wrinkle is about six inches deep at the waterline and extends entirely across the bottom. The shell is torn between frames 93-94 for a length of about eight inches. It has a maximum opening of about 3/4 inch at the welded intersection of the tank top with the shell. The tank top (inner bottom) is wrinkled between frames 93 and 94 from the port side, inboard, at least 20 feet, and presumably entirely across the vessel. The starboard shell is also wrinkled in this area with the most pronounced buckle at frame 95-96. a second compression failure, originating in a sagging condition, is located at frame 98 on the port side. The wrinkle starts below the waterline and continues up to the main deck. This wrinkle is reflected in the main and upper decks and appears to be present in the after stack. Another compression

wrinkle runs from the main deck to below the waterline at frame 125 on the port side. A pronounced pattern of shear wrinkles appears in the area of the neutral axis between frames 40 and 60 on the port side. The pattern is upward and forward. A light panel failure is present on the starboard side opposite.

In addition to these evidences of severe bending stresses failures due to a strong underwater shock, principally affecting the bottom and port side, are present. The port shell is severely dished between the tank top and the first platform. The maximum effect extends approximately from bulkhead 68 to frame 100. Forward and aft of these limits, moderate dishing between frames occurs. Between bulkheads 83 and 93 in the Auxiliary Machinery Space, the entire panel is dished about six inches and all transverse stiffeners on the panel are tripped. In the forward Machinery Space (frames 68-83), the port shell is dished about two to three inches in the same location and transverse stiffeners show evidence of high stress. A similiar condition exists in the forward portion of the After Machinery Space. The starboard shell is also dished but more lightly and generally between frames. Bulkheads 68, 83, 93, 108, and associated web frames, suffered considerable distortion adjacent to the port shell. The bottom of the vessel evidently moved violently upward under the action of the underwater shock wave. This movement resulted in the crushing of all main bulkheads in the midship half length along their bases. Severe distortion generally extends up to the second platform. Centerline girders (H-sections) in the machinery spaces are badly buckled in the lower portion. The upward force was transmitted via bulkheads and stanchions to the upper levels. All web girders, bulkheads, and stanchions in the machinery spaces and forward and after holds, up to the upper deck, exhibit signs of severe working in compression. Decks and platforms are distorted and moved with accompanying damage to machinery thereon. Crushing of deckhouse sides in way of main bulkheads has been amplified by downward movement of the main structure during whipping of the ship girder.

MACHINERY

No comment.

ELECTRICAL

Structural damage was not noted in detail, but was general throughout the vessel. Much machinery shifted, with possible damage to foundations. Numerous bulkheads, vent ducts and other light sheet metal installations were distorted, with resultant damage to electrical installations mounted thereon.

(c) Other damage.

HULL

Severe distortion of the hull resulted in the inoperability of most machinery and electrical equipment. No actual failures of structural foundations of major machinery units were observed although shock and deflection of the foundations resulted in general shearing and elongation of holding down bolts. Piping suffered severe shock damage which rendered much equipment inoperable.

MACHINERY

The machinery of this vessel was so severely damaged by Test B that it is believed to be beyond economical repair. Both boilers had casings ruptured, foundations failed, extensive damage to brickwork, etc. The forced draft blower jammed. Holding down bolts of the forward main motor sheared off. Foundation bolts of both main turbines and the after main motor were loosened. All main motors and main turbines are probably out of alignment. The main condenser foundations buckled. Nearly all pumps are badly out of alignment because of foundation failures. All ship's service generators are out of alignment from foundation failures. Two cargo winches were knocked overboard. Other deck machinery was severely damaged. There is much other damage not listed here.

ELECTRICAL

Damage to the ship's electrical equipment was due to flooding, to shock and to collapse of supporting structure. Both main motors had shifted on foundations. The after main generator the after main engine control board and numerous auxiliaries had also shifted. All machines and switchboards in the three machinery spaces were

flooded with both water and fuel oil.

Some local wiring was broken or pulled from boxes by collapsing supporting structure. Shock caused a general disloding of heavy electrical equipment in the superstructure spaces.

II. Forces evidenced and Effects Noted.

(a) Heat.

HULL

There is no evidence of heat.

MACHINERY

There was no evidence of heat.

ELECTRICAL

There was no evidence of heat on the vessel.

(b) Fires and Explosions.

HULL

There were no fires or explosions.

MACHINERY

There was no evidence of fires or explosions.

ELECTRICAL

There were no fires or explosions on the vessel.

(c) Shock.

HULL

There is considerable evidence of underwater shock which resulted in shearing of holding-down b lts, in undogging of doors, and in damage to delicate equipment. Light bulbs were not shaftered except in isolated instances. There is much evidence of violent movement of the vessel which resulted in displacement of deck and main machinery, furniture, and equipment, and in shifting of the permanent ballast.

MACHINERY

The FALLON received and underwater shock of tremendous magnitude, as evidenced by the damage listed above and numerous other examples.

ELECTRICAL

Shock caused great damage throughout the v ssel. Much machinery, auxiliary machinery, and heavy pieces of electrical equipment was displaced from foundations by shock. The emergency diesel generator although not damaged in itself, was put out of action by the dislodging and breakage of the diesel starting batteries.

(d) Pressure.

HULL

Dishing of the port shell and bottom resulted from the underwater pressure wave. The deformation of the shell caused distortion of frames, brackets, and bulkheads connected to the shell plating. Some evidence of air blast pressure may be seen in the slight dishing of superstructure bulkheads.

MACHINERY

There was little, if any, evidence of pressure. The stacks were moderately dished but this may have been caused by the heavy mass of water falling on the vessel immediately after Test B.

ELECTRICAL

No pressure effects were found in any electrical equipment.

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

HULL

In addition to the phenomenon of radioactivity, the huge wave generated by the Test B detonation seriously strained the hull and dislodged equipment. Such surface disturbance have never been experienced before during underwater detonations.

MACHINERY

An underwater shock of this magnitude is apparently peculiar to the Atom Bomb.

ELECTRICAL

No effects peculiar to the atom bomb were found on any electrical system.

III. Effects of Damage.

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

HULL

The ship was left without power or lighting.

MACHINERY

The machinery plant is completely inoperable. The plant as a whole is believed to be beyond economical repair as many units appear to be unsalvageable. A few scattered auxiliaries may be operable but no power is available for them. A more complete inspection than was possible in this case would undoubtedly disclose additional damage.

ELECTRICAL

The shifting of the forward and after main motors,

the after main generator and the after main control board would have disabled the vessel even if no flooding had occurred. Flooding of the machinery spaces put all main machinery and auxiliaries out of commission.

(b) Effect on gunnery and fire control.

HULL

Loss of power would have inhibited fire control.

MACHINERY

No comment.

ELECTRICAL

The loss of all electrical power would have put the guns on manual operation.

(c) Effect on watertight integrity and stability.

HULL

Stability was reduced considerably but the vessel is believed to have remained in a stable condition with positive metacentric height. Watertight integrity is reduced considerably by crushing of bulkheads, by piping failures, and by the tear in the port shell. All openings were of such size that control of flooding by active damage control was possible.

MACHINERY

No comment.

ELECTRICAL

The failures in the electrical system had no effect on the watertight integrity and the stability.

(d) Effect on personnel and habitability.

HULL

Excluding the effects of radioactivity, personnel casualties from shock and wave action would have been severe. Habitability of the ship was reduced by desarrangement of furniture and equipment and the loss of all power.

MACHINERY

It is estimated that a high percentage of the crew below decks would have been casualties from the effect of the shock, and that all topside personnel would have been lost. The ship was made uninhabitable by loss of power, extensive damage, flooding, and high radioactivity.

ELECTRICAL

The loss of all electrical power would cause failure of ventilation, some galley equipment, water pumps and lighting with the corresponding loss of habitability. Electrical failures would not have affected personnel directly.

(e) Total effect on fighting efficiency.

HULL

Extreme hull damage, loss of all power and lighting, and heavy personnel casualties would have severely reduced the fighting efficiency of the vessel. If at sea, all efforts would have had to be directed toward saving this badly damaged vessel and toward getting her to port.

MACHINERY

Fighting efficiency was completely destroyed.

ELECTRICAL

The disabling of both main propulsion generators and motors by movement on the foundations would have reduced mobility and fighting efficiency to zero.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

Material damage to hull and machinery was extreme and bordered on complete destruction.

MACHINERY

It is believed that this vessel would have been lost if she had been in the open sea at the time of the test.

ELECTRICAL

The total fighting effectiveness of the vessel would have been lost.

Casualties would have been high.

Almost all failures of electrical equipment were due to failure of supports or foundations, due to inherent weakness of the equipment.

The failure of the main motors and other large electrical machines, by shifting on the foundations, is comparable in importance with the buckling that occurred in the hull; and the general damage with attendent high personnel casualties through the superstructure and weather spaces.

V. Any Preliminary General or Specific Recommendations.

HULL

The performance of this vessel greatly exceeded expectations. No remedial action is indicated and it is not considered practicable to design this type of vessel to resist the high forces experienced by the FALLON.

MACHINERY

It is doubtful whether machinery can be designed to withstand such a severe shock at such a close range. However, it is recommended that efforts be made to improve the resistance of all machinery to shock.

ELECTRICAL

In view of the general structural damage and the serious hull failure, it is not deemed necessary to attempt any strengthening or stiffening of electrical machinery foundations without a general redesign of the entire Vessel.

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

None.

MACHINERY

No comment.

ELECTRICAL

There was no apparent structural damage.

(c) Other Damage.

HULL

Not observed.

MACHINERY

The machinery of this vessel was not damaged by Test B.

ELECTRICAL

The electric plant and electrical elements of ship control, fire control and gunnery were undamaged and operable.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None evidenced.

(b) Fires and Explosions.

HULL

None.

None.

MACHINERY

No evidence.

ELECTRICAL

None evidenced.

(c) Shock.

HULL

None.

MACHINERY

The ship apparently received a slight shock. The only evidence of this is the fact that leads left in the forward bearing of

#1 main turbo generator indicate a slight motion of the rotor, not over .003 inch.

ELECTRICAL

There was no damage to electrical equipment as a result of shock.

(d) Pressure.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of damage to any electrical equipment as a result of pressure.

(e) Effects peculiar to the Atom Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

Radioactivity was the only effect noted peculiar to the atom bomb.

III. Results of Test on Target.

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

HULL

None.

MACHINERY

None.

ELECTRICAL

No effect.

(b) Effect on gunnery and fire control.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No effect.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No effect.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None.

ELECTRICAL

1. Other than the effects from radioactivity, it is believed that there would have been no personnel casualties.

2. There was no material damage which would affect the habitability of this vessel.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

Slight effect if any would have been noted in the fighting efficiency of this vessel.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

The FILLMORE was outside the effective range of the explosion during Test B.

ELECTRICAL

The material condition of this vessel is such as to indicate its position in the target array was outside the effective radius of the bomb. Other than radioactivity there was no evidence of this ship having been subjected to any unusual forces. Some compartments, particularly those below waterline and in vicinity of underwater shell plating are radioactive.

V. Any preliminary general or specific recommendations of the Inspecting Group.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

HULL

	Forward	Aft	List
Before test	8' 9"	18' 4"	0°
After test	9' 0"	19' 9"	2° Port

Flooding was confined to the port and starboard shaft alleys and the after machinery space. Flooding in the shaft alleys probably came through the stern tubes and from the after machinery space through the shaft glands. The after machinery space and both shaft alleys flooded to a depth of about 8 feet from a broken salt water cooling line to a spring bearing. The overboard valve for this line had been inadvertently left open. It is considered that the ship's force could have controlled all flooding.

(b) Structural damage.

HULL

The most significant damage is a wrinkle in the shell at frame 95. It runs downward from just below the port sheer strake, under the bottom, and up, almost to the starboard sheer strake. The bottom is further wrinkled between frames 80 and 81 and frames 111 and 113. There is also panel dishing of the bottom from frames 76 to 115. Part of the port and starboard bilge keels are missing. The starboard shaft fairwater is separated from the hull. There is considerable dishing of topside doors and light metal structures and distortion of below decks metal joiner bulkheads. Ladder pins are sheared and handrails are broken. Platforms in the after machinery space in way of frames 94-95, port and starboard, are badly wrinkled. Centerline stanchions at frames 76 and 101 in the machinery spaces, show compression stress patterns. Several bulkheads are wrinkled and watertight doors are sprung.

MACHINERY

The outer casings of both stacks were moderately dished in.

ELECTRICAL

There was no structural damage noted which affected electrical equipment.

(c) Other damage.

HULL

The structural damage to the shell could have affected the operability of the main machinery if misalignment of the shafts or movement of the machinery have resulted.

MACHINERY

Machinery on the lower level of the after engine-room was damaged by flooding. There is a large amount of other damage. Boiler brickwork was moderately damaged. Foundation bolts were loosened on a number of units, including #1 main turbine, forward ship's service generator, all main and auxiliary condensers. Cracked paint around foundations indicates momentary displacement of a number of units. The foundation of the motors for the refrigerating compressor and the starboard jacking gear failed so that the motors are no longer connected to these units. The cast iron foundations of the machine shop lathes and milling machine broke; these units fell and were severely damaged. The steam connection to the forward auxiliary condenser broke. The hot water storage tank, hung from the overhead of the after engineroom, broke away and fell, bending or rupturing all connected piping. There was other damage of a minor nature throughout the engineering plant.

It is believed that a great deal of damage, such as condenser leaks, rotating machinery out of alignment, etc., exists that could not be found by visual inspection.

It is considered certain that if the machinery of this vessel had been in operation at the time of the test, very heavy damage would have occurred.

ELECTRICAL

Principle electrical damage consisted of the following:

1. Holding down bolts for propulsion motors and generators were loosened.

2. All equipment located in the flooded areas was damaged by submersion in water and fuel oil.

3. The frame of the exciter for the #3 AC ship's service generator set was cracked. Holding down bolts for the DC ship's service generator sets were loosened.

4. Portable batteries were damaged by being thrown out of their racks.

5. Refrigeration motors and one jacking gear motor were torn from their mountings. Some galley equipment and machine tool motors and controllers were damaged. One cargo winch controller was damaged by water.

6. Approximately 20 percent of the lamps on the vessel were broken. Both 24 inch searchlights were damaged.

7. The master gyro compass, the standard magnetic compass at secondary control, and two gyro repeaters were damaged.

8. One rudder angle indicator and the wind intensity system were damaged.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

There was no evidence of heat.

ELECTRICAL

There was no evidence of heat.

(b) Fires and explosions.

HULL

None.

MACHINERY

There was no evidence of fires or explosions.

ELECTRICAL

There was no evidence of any fires or explosions.

(c) Shock.

HULL

There is considerable evidence of shock, such as, equipment thrown out of socket stowages, breakage of light bulbs, distortion of machinery foundations, and failure of piping.

MACHINERY

This vessel received a severe underwater shock. There are inumerable evidences of this shock; including cracked paint and loosened holding down bolts at foundations of machinery; broken piping; broken foundations of motors and machine shop equipment, disarranged boiler brickwork, loose gear thrown around, etc.. Whipping motion of the vessel, or the mass of water thrown on her, or both, are believed to have caused the dishing in of the outer casings of both stacks.

ELECTRICAL

There was evidence of underwater shock on this vessel. This shock is evidenced by the loosening of foundation bolts, the cracking and breaking of cast iron parts, broken lamps, battery disarrangement, and by the damage to the master gyro compass. It is also considered that the underwater shock contributed to the damage to the topside equipment.

(d) Pressure.

HULL

Blast or water pressure is evidenced by displacement of hatch and pontoon covers from both cargo hatches, dished superstructure doors and access trunks, and slight displacement of the upper deck. The upper deck displacement caused buckling of light bulkheads below.

MACHINERY

There was no evidence of pressure.

ELECTRICAL

There was evidence of both air blast and water pressure on this vessel. It is considered that the combination of these two forces were the cause of most of the damage to electrical equipment located topside in exposed locations.

(e) Effects apparently peculiar to the atom bomb.

HULL

Only effects noted peculiar to the atom bomb are radioactivity and wave phenomena.

MACHINERY

An underwater shock of this magnitude is apparently peculiar to the atom bomb.

ELECTRICAL

Radioactivity was the only effect noted that is considered peculiar to the atom bomb.

III. Effects of Damage.

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

HULL

Flooding seriously affected propulsion.

MACHINERY

The effects of the damage on machinery are difficult to assess because of the limited nature of the inspection. It was not practicable to test any machinery except the anchor windlass, as no power was available on the ship. Machinery could not be opened for interior inspection, and a few units could not be inspected at all as time for inspection was limited by radiological hazard. Leads left in bearings of one main turbine and one ship's service generator were not removed for this reason.

Effects of visible damage are as follows:

The after engine room is inoperable because of flooding but this could have been controlled if the crew had been aboard. Otherwise, both boilers could be steamed at full power for some time but minor repairs (requiring 4 to 8 hours) to brickwork would be required for extended operations. The forward ship's service generator (for deck equipment), refrigeration plant, and a few unimportant auxiliaries are inoperable but could be made operable within 8 hours. Machine shop equipment is believed to be beyond repair.

The above estimate should be received with great caution. The magnitude of the shock received by the vessel, and the damage done to machinery on other vessels (FALLON, HUGHES, LST-133), only slightly closer to the explosion, are believed to warrant the

conclusions that a great deal of damage exists that could not be discovered by the limited inspection made. It is considered certain that, if the machinery had been in operation at the time of the test, severe damage would have been done to rotating machinery and the vessel would have been completely immobilized.

ELECTRICAL

The bomb explosion and subsequent flooding seriously damaged the ship's control and electrical equipment. It is believed that the flooding could have been controlled and much flooding damage eliminated if there had been a crew aboard the vessel or if the vessel could have been reboarded within a few hours after the explosion. The electric propulsion and ship's service plants would probably have been temporarily put out of service if the ship had been steaming at the time of the explosion. It is considered that the electric plant could have been put into operation within a few minutes so that the ship could have steamed and electric power would be available provided there were not too many serious casualties to key engineering personnel.

(b) Effect on gunnery and fire control.

HULL

No comment.

MACHINERY

No comment.

ELECTRICAL

Fire control circuits used in conjunction with the gyro compass were put out of commission due to the damage to the gyro. A major overhaul of the gyro compass would be required to make it operable.

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

HULL

The effect, in general, on water-tight integrity was negligible since both sources of flooding could have been corrected by ship's force. The effect on stability of the flooding of the after machinery space and shaft alleys is considered to be negligible.

MACHINERY

No comment.

ELECTRICAL

Water-tight integrity and stability were not affected by failure of electric equipment. No progressive flooding occurred along cables and no electric equipment shifted on its foundation sufficiently to affect stability.

(d) Effect on personnel and habitability.

HULL

Aside from the effects of radioactivity, it is considered that personnel and habitability would have been affected as the result of shock, roll, high waves, possible blast effect, and displacement of gear.

MACHINERY

It is believed that all personnel below deck would have been dazed by the shock and that a considerable number of them would have been killed or injured. Personnel topside would probably have had a high percentage of casualties. Habitability was destroyed by high radioactivity, and was otherwise reduced by loss of power, damage to galley equipment, and general disarrangement of the ship.

ELECTRICAL

The personnel on this vessel would have been affected by the radioactivity. The extent of the casualties and the time elapsed before these casualties would have rendered personnel incapable of performing their duties should be ascertained from the medical reports of the test. It is considered that exposed personnel would have suffered serious casualties due to the wave action and air blast. It is also considered that personnel inside the vessel would have suffered casualties due to displacement of gear and due to the underwater shock. Habitability was affected due to radioactivity and from the electrical standpoint, by the damage to galley equipment and refrigeration plant.

(e) Total effect on fighting efficiency.

HULL

Although the buoyancy, stability, and watertight integrity of this ship were not appreciably affected, the seaworthiness of the ship was greatly affected by a reduction of longitudinal strength. The change in hull alignment might have caused some loss in usability of machinery. The total effect would be a considerable loss in fighting efficiency approaching total loss.

MACHINERY

It is estimated that if the vessel had been underway at the time of the test, damage to machinery would have completely immobilized her and required a major overhaul at a shipyard.

ELECTRICAL

Electrically the fighting efficiency of the vessel would have been seriously affected temporarily since it is almost certain that power for both ship's service and propulsion equipment would have been interrupted. With the exception of the master gyro compass and searchlights, it is considered that the ship's force in a short time could have made sufficient repairs to operate the ship at only slightly reduced efficiency. This statement is based on the assumption that sufficient uninjured personnel of the ship's engineering crew would remain for repair and operation of the ship's electrical equipment.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

Aside from radiological effects, this ship suffered severe, but not crippling, damage. Several days would have been required to clear up the interior sufficiently to permit satisfactory use. The hull strength was sericusly reduced but was such that the ship could probably have been sailed to a repair base, providing no severe weather was encountered.

MACHINERY

The GASCONADE was at a range at which the most severe damage to vessels of her type began to diminish slightly.

ELECTRICAL

The ship received considerable damage as a result of the underwater atomic bomb explosion. It is believed, however, that with the exception of the searchlights and the master gyro compass, that electrical equipment of the latest navy shockproof design, properly mounted, would have received very minor if any damage as a result of this test.

V. Preliminary General or Specific Recommendations of Inspection Group.

HULL

More satisfactory means of closing cargo hatches should be developed. Light structures topside should be built in for protection. Furniture and equipment should be more firmly secured in place and shock mounted where necessary.

MACHINERY

A detailed study of the machinery of this vessel under favorable conditions would be very instructive. Such a study

should include particularly alignment of rotating machinery and shafting, interiors of turbines and condensers, and tests of piping.

ELECTRICAL

It is recommended that consideration be given to the redesign of the 24-inch searchlights and the master gyro compass to give them resistance to shock and air blast comparable with that of other electrical equipment on the vessel.

It is recommended that consideration be given to more adequate stowage or securing of loose gear such as storage batteries, spare parts and floor plates.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

Not observed.

(c) Other damage.

HULL

Not observed

MACHINERY

The machinery of this vessel was not damaged by Test B.

ELECTRICAL

There was no damage to electrical equipment.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

No evidence of heat.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

No fires or explosions.

(c) Shock.

HULL

Several dozen light bulbs were broken.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock damage to electrical equipment.

(d) Pressure.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure damage to electrical equipment.

(e) Effects apparently peculiar to the atom bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

No effects peculiar to the atom bomb were noted.

III. Effects of Damage.

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

HULL

None.

MACHINERY

None.

ELECTRICAL

There was no effect from Test B.

(b) Effect on gunnery and fire control.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

There was no effect on gunnery or fire control.

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

HULL

None.

MACHINERY

No comment.

ELECTRICAL

There was no effect from Test B.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None.

ELECTRICAL

No effect on habitability of the vessel from electrical damage.

(e) Total effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

There would be no effect on the fighting efficiency of the vessel from electrical damage.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

The GENEVA was outside the effective range of the explosion during Test B.

ELECTRICAL

As there was no damage from Test B no conclusions were made by the observers.

V. Preliminary General or Specific Recommendations of Inspection Group.

HULL

None.

MACHINERY

None.

ELECTRICAL

No recommendations.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

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

(b) Structural damage.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

There was no structural damage. A few hatch boards were dislodged from upper deck of the forward and after cargo hatches. This caused no damage, electrical or otherwise.

(c) Other damage.

HULL

Not observed.

MACHINERY

None.

ELECTRICAL

Close visual inspection and operating test conducted on

practically all electrical equipment and electrical elements associated with ship control, fire control and gunnery revealed no damage whatsoever.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None.

(c) Shock.

HULL

About four metal sections of the upper deck covers of both cargo hatches were dislodged and fell to the main deck. This

may have been caused by shock or by rapid motion of the ship.

MACHINERY

No evidence.

ELECTRICAL

1. Slight shock possibly in conjunction with negative pressure wave is believed to be cause of loosening and lifting hatch boards previously mentioned under I(b).

2. There was no damage to any electrical equipment as a result of shock.

(d) Pressure.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There is no evidence of pressure except negative pressure described under shock, above.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

None other than radioactivity.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

The test had no effect on the machinery of this vessel. Full operation was resumed immediately after the test.

ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

None.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

None.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None.

ELECTRICAL

Other than effects of radioactivity it is believed there would be no personnel casualties or any adverse effects on habitability.

(e) Effect on fighting efficiency.

HULL

None.

MACHINERY

None.

ELECTRICAL

There has been no reduction in the fighting efficiency of this vessel as a result of any material damage.

IV. Summary of Observers' Impressions and Conclusions.

HULL

None.

MACHINERY

The NIAGARA was outside the effective range of the explosion during Test B.

ELECTRICAL

The position of this vessel in the array was such that it was not subjected to any unusual forces except radioactivity. There was no material damage. Approximately four days after blast ship was reboarded and she has since been underway. Normal shipboard routine has been established and the ship reported ready by the Commanding Officer for further assignment.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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. When the ship was inspected 19 days after the test, the main auxiliary machinery spaces contained about 12 inches of water. This is considered normal leakage.

(b) Structural damage.

HULL

The main deck has apparently suffered additional damage in the area surrounding the elevator. There is some deflection of the main deck and slight distortion of the girder brackets.

MACHINERY

No comment.

ELECTRICAL

No structural damage occurred to effect the electrical plant.

(c) Other damage.

HULL

Not observed.

MACHINERY

There was no damage to the machinery of LST 52 during Test B, insofar as can be determined by visual inspection. It was not practicable to operate machinery on this vessel after Test B be-

cause of radioactivity, which was high when the ship was inspected 19 days after Test B.

ELECTRICAL

No damage occurred.

II. Forces evidenced and effects noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

No heat was evident.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

No fires or explosions occurred.

(c) Shock.

HULL

The only evidence of shock is that a few light bulbs are broken.

MACHINERY

No evidence.

ELECTRICAL

No damage occurred.

(d) Pressure

HULL

About two-thirds of the hatch boards over the cargo hatch were displaced and fell to the main deck.

MACHINERY

No evidence.

ELECTRICAL

No damage occurred.

(e) Effects peculiar to the Atomic Bomb.

HULL

The only effects peculiar to the atom bomb are radioactivity and wave phenomena.

MACHINERY

None.

ELECTRICAL

No effects noted other than radioactivity.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

None, insofar as can be determined by visual inspection.

ELECTRICAL

No effect was noted.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

No effect occurred.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No effect occurred.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None, except for possible effects of radioactivity.

ELECTRICAL

No effect occurred.

(e) Effect on fighting efficiency.

HULL

The only effect on fighting efficiency would have been resulting from radiological conditions.

MACHINERY

None, except for possible effects of radioactivity.

ELECTRICAL

No effect occurred.

IV. Summary of Observer's Impressions and Conclusions.

HULL

No comment.

MACHINERY

LST 52 was outside the range of mechanical damage to machinery from the explosion of Test B.

ELECTRICAL

This ship was located too great a distance from the subsurface blast to suffer any damage to the electrical equipment.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

HULL

Drafts	Forward	Aft	List
Before Test B	7'6"	10' 6"	0
After Test B	8'6"	10' 0"	0

About 20 tons of water entered the tank space forward when the main deck was inundated. There is a small amount of drainage water in several second deck compartments. This combined with leakage at the rate of about four tons a day, probably through the stern tubes, has resulted in the above final drafts. A total of 100 tons of water has been taken aboard the ship.

The bilge control room, A-407ET, is completely flooded. Shock damage to two manifolds in A-407ET has made this space common with the adjacent wing ballast tanks, A-405W and A-406W, through a ballast line and all three common with the auxiliary machinery space, through a drainage line. The bilge control room flooded partially as a result of run-off from the two ballast tanks. Flooding into the three forward spaces continued as water drained from the auxiliary machinery space. The auxiliary machinery space, main machinery space and shaft alleys all flooded approximately five feet deep through failures in piping to adjacent ballast, fresh water, and diesel oil tanks.

MACHINERY

Both shaft alleys were completely flooded. The main engine room was flooded to about 9 inches above the lower level floor plates. The auxiliary engine room was flooded to about one foot above the lower level floor plates. The source of the water was undetermined. It may have entered the ship through the shaft glands.

ELECTRICAL

No comment.

(b) Structural Damage.

HULL

The superstructure plating and framing is undamaged. Light structure and equipment topside has been damaged seriously by the wave which inundated the vessel and by falling water. The main deck has suffered a panel deflection with about three inches permanent set and is dished locally between frames. The girders and end connections of the supporting structure are distorted. The elevator has been driven down to the tank deck, bending the side support lugs on the coaming and breaking the port lifting cable. The shell and interior structural bulkheads are generally intact. The interior compartments are a shambles of wrecked furniture and displaced equipment.

MACHINERY

No comment.

ELECTRICAL

No comment.

(c) Other damage.

HULL

The vessel's machinery and equipment have not been operated. Hull damage would have affected operability only slightly.

MACHINERY

Machinery of this vessel received severe damage from Test B. Much of it is probably beyond economical repair. All three diesel generator engines were thrown off their foundations and severely damaged. Main engine foundation bolts were loosened and the engines are probably out of alignment. Both ballast pumps were thrown off their foundations and badly damaged. Two of the four davit winches were severely damaged by foundation failures and are probably beyond repair. The elevator winch was considerably damaged, also by foundation failures. The elevator cable parted and the elevator platform fell to the tank deck. It is probably beyond repair. The machine shop lathe was knocked off its foundations and wrecked. There was a large amount of other less important damage.

ELECTRICAL

In addition to flooding damage to the ship's service switchboards, diesel generator sets and motors mounted in the auxiliary machinery was damaged by primary effects of the underwater burst.

1. Ship's service generators.
2. Ballast pumps in auxiliary machinery space.
3. Welin boat davit motors.
4. Elevator motor.
5. Gyro compass and repeaters.
6. Magnetic compasses.

7. Distribution panels.

8. Miscellaneous indicating equipment.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

There is no evidence of heat.

MACHINERY

No evidence.

ELECTRICAL

None observed.

(b) Fires and Explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

None observed.

(c) Shock.

HULL

There was a strong underwater shock which exhibited an upward tendency. The entire hull is affected. Furniture is thrown about, equipment dislodged and several auxiliary machinery foundations failed. No ruptures are believed to have occurred, nor have any joint failures been observed in the exterior hull structure.

MACHINERY

Apparent direction; areas affected; critical scantlings; nature of joint failures (general); effect on machinery and equipment; significant behavior of structure or equipment.

The LST 133 received a very heavy underwater shock. This shock and the resultant whipping action of the vessel apparently caused all or nearly all of the damage mentioned above. There were numerous other evidences of heavy shock, such as furniture torn loose and thrown around, floor plates and gratings disarranged, etc.

ELECTRICAL

This vessel undoubtedly was subjected to a very strong shock wave. This shock wave was manifested by the following damage:

1. Ship's service generators displaced from foundations.

2. Ballast pumps cracked at foundation.

3. Starting batteries jumped out of battery racks.

4. Welin boat davit motors cracked at base.

5. Gyro compass gimbal mounting springs broken.

(d) Pressure.

HULL

There is no evidence of a pressure blast, but a wave flooded over the ship, doing considerable damage to light structures and equipment topside.

MACHINERY

Apparent direction (if any); areas affected; critical scantlings; general nature of failures; significant behavior of structure and equipment.

There is no direct evidence of pressure. However, some of the topside damage may have been caused by blast pressure, as well as the large mass of water thrown upon the vessel.

ELECTRICAL

None observed.

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

HULL

Excluding the radio activity, the wave damage was the unique feature of the test.

MACHINERY

An underwater shock of this magnitude is apparently peculiar to the Atom Bomb.

ELECTRICAL

Coral sand found topside indicated that this vessel was inundated by a large mass of water. This water damaged some topside electrical equipment such as the starboard floodlight. This water was also a possible source of damage to the standard magnetic compass.

III. Results of test on target.

(a) Effect on propulsion and ship control.

HULL

Effect on propulsion unknown. One rudder is damaged but the other is apparently intact.

MACHINERY

The ship was left immobilized and without power of any kind by Test B. Temporary repairs are impracticable. Several months work at a naval shipyard would be required to restore her to normal operating condition. Much of her machinery is beyond repair.

ELECTRICAL

The damage to electrical equipment would have resulted in complete loss of electric power. Damage to main engine starting batteries probably would prevent starting the main engines. With loss of power, electric steering would be inoperative, and hand steering would have to be resorted to. Damage to the gyro compass and magnetic compasses would have seriously hampered ship navigation.

(b) Effect on gunnery and fire control.

HULL

MACHINERY

No comment.

ELECTRICAL

With loss of electric power, all electrically driven anti-aircraft guns and directors would have been inoperative. Hand pointing and firing would have been required.

(c) Effect on watertight integrity and stability.

HULL

Negligible.

MACHINERY

No comment.

ELECTRICAL

There was no visible indication that Test B had any effect on water-tight integrity and stability of this vessel from an electrical standpoint.

(d) Effect on personnel and habitability.

HULL

Personnel casualties would have been heavy. The habitability of the ship is seriously decreased.

MACHINERY

All personnel on this vessel would probably have been killed by shock and the effect of flying heavy objects all over the ship. Habitability was completely destroyed by loss of power, extensive damage and general disarrangement of the ship. In addition, radioactivity was very high when the ship was inspected 19 days after Test B.

ELECTRICAL

Electrical damage had a very great effect on habitability, since the loss of electric power would result in loss of lighting, ventilation, fresh water pumping facilities and cooking facilities.

(e) Total effect on fighting efficiency.

HULL

Fighting efficiency is reduced to about 50% due to main deck damage, elevator damage, and damage to interior equipment.

MACHINERY

Fighting efficiency was reduced to zero.

ELECTRICAL

Electrical damage had a very large effect on the fighting efficiency, since the loss of electric power would result in loss of power to guns, steering and deck machinery.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

The hull proper stood up well under the attack but furniture, fittings, equipment and machinery, are severely damaged.

MACHINERY

This vessel might have been lost if she had been underway at sea at the time of the test.

ELECTRICAL

This vessel was subjected to a violent shock wave, apparently from the bottom of the vessel. This shock rendered the electric plant completely inoperative. It is considered that with suitable diesel generator mounting arrangements, modern navy motors and controllers, adequate protection against electrical damage from flooding, and suitable battery supports, this vessel would have withstood the underwater burst, from an electrical standpoint.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

1. Studies should be made to improve the resistance of this type of naval machinery to shock.

2. The shock absorbing qualities of the foundations of the diesel generator engines on this vessel are inadequate to withstand a shock of this magnitude. They should be either improved or abandoned. It is noted that the main engine foundations, which are not of the shock absorbing type, withstood the test.

3. Machinery should not be 'stacked' vertically. On this vessel the motors of the davit winches are mounted on top of the clutches, these in turn on top of the speed reducers, which are on top of the winches. This arrangement appears to be very vulnerable to shock.

ELECTRICAL

It is recommended that electrical equipment mounted in the machinery spaces be afforded adequate protection against flooding. Supporting means for the gyro compass element should be made more resistant to shock. Battery racks should be modified to prevent dislodgement of the batteries under shock conditions. The design of shock or vibration mounts for diesel generator sets should be studied with the object of making them more resistant to heavy shock damage.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

There was no structural damage in way of electrical equipment.

(c) Other damage.

HULL

Not observed.

MACHINERY

There is no damage to machinery of this vessel, insofar as can be determined by visual inspection. No machinery on this vessel was operated after Test B.

ELECTRICAL

No damage occurred to electrical equipment due to Test B.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat in way of electrical equipment.

(b) Fires and explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There were no fires or explosions in way of electrical equipment.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock in way of electrical equipment.

(d) Pressure.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure in way of electrical equipment.

(e) Effects peculiar to the atom bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

Evidence of radioactivity was the only effect noted which was peculiar to the atom bomb.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

None.

ELECTRICAL

No damage was apparent to electrical machinery or ship control.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

No damage was apparent to gunnery and fire control.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No electrical damage affected watertight integrity or stability.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None.

ELECTRICAL

No electrical damage affected personnel or habitability.

(e) Effect on fighting efficiency.

HULL

The only effect on the fighting efficiency is that resulting from radiological contamination.

MACHINERY

None.

ELECTRICAL

No electrical damage affected the fighting efficiency of the vessel.

IV. Summary of Observers' Impressions and Conclusions.

HULL

None.

MACHINERY

LST 220 was outside the effective range of the explosion during Test B.

ELECTRICAL

No damage was evident on any electrical equipment on this vessel. It appears that present electrical equipment has sufficient shock resistance to withstand the effects of the B Bomb at the distance of this vessel from the center of the blast.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

There was no structural damage in way of electrical equipment.

(c) Other damage.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

No damage occurred to electrical equipment due to Test B.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat in way of electrical equipment.

(b) Fires and Explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There were no fires or explosions in way of electrical equipment.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock in way of electrical equipment.

(d) Pressure.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure in way of electrical equipment.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None.

ELECTRICAL

There were no effects peculiar to the Atom Bomb noted in way of electrical equipment.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

Machinery was not affected by Test B, as far as can be determined by visual inspection. It was not practicable to operate any machinery on this vessel after Test B.

ELECTRICAL

No damage was apparent to electrical machinery or ship control.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

No damage was apparent.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No electrical damage affected watertight integrity or stability.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None, except for possible effects of radioactivity.

ELECTRICAL

No electrical damage affected personnel or habitability.

(e) Effect on fighting efficiency.

HULL

The sole effect on this ship is that resulting from radiological contamination.

MACHINERY

None, except for possible effects of radioactivity. As the ship was fully operable, it is believed that she could have evacuated the contaminated area without being seriously affected.

ELECTRICAL

No electrical damage affected the fighting efficiency of the vessel.

IV. Summary of Observers' Impressions and Conclusions.

HULL

No comment.

MACHINERY

LST 545 was outside the effective range of the explosion during Test B.

ELECTRICAL

No damage due to Test B was evident on any electrical equipment on this vessel. It appears that present electrical equipment has sufficient shock resistance to withstand conditions existing at the distance of this vessel from the blast.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

There was no structural damage.

(c) Other damage.

HULL

Not observed.

MACHINERY

None.

ELECTRICAL

There was no damage to any electrical equipment.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of heat in way of electrical equipment.

(b) Fires and Explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There were no fires or explosions in way of electrical equipment.

(c) Shock.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of shock in way of electrical equipment.

(d) Pressure.

HULL

A temporary cargo hatch cover was installed to replace that burned in Test A. The canvas of the cover is disarranged and the wood is dislodged. This is apparently the result of blast or falling water.

MACHINERY

No evidence.

ELECTRICAL

There was no evidence of pressure in way of electrical equipment.

(e) Effects peculiar to the Atomic Bomb.

HULL

None.

MACHINERY

None, except radioactivity.

ELECTRICAL

Radioactivity in way of exposed equipment was the only effect noted peculiar to the Atom Bomb.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

The test had no effect on machinery, as far as could be determined by visual inspection. No machinery on this vessel was operated after Test B because of radioactivity, which was fairly high when the ship was inspected 18 days after Test B.

ELECTRICAL

No damage was apparent to electrical machinery or ship control.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

No electrical damage affected gunnery or fire control.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

No electrical damage affected watertight integrity or stability.

(d) Effect on personnel and habitability.

HULL

None.

MACHINERY

None, except radioactivity.

ELECTRICAL

No electrical damage affected personnel or habitability.

(e) Effect on fighting efficiency.

HULL

The only effect on fighting efficiency would be that resulting from radiological contamination.

MACHINERY

None, except for possible effects of radioactivity. As the machinery was fully operable, the ship could probably have left the contaminated area without being seriously affected.

ELECTRICAL

No electrical damage affected the fighting efficiency of the vessel.

IV. Summary of Observer's Impressions and Conclusions.

HULL

No comment.

MACHINERY

LST 661 was outside the range of physical damage from the explosion in Test B.

ELECTRICAL

No damage was evident on any electrical equipment due to Test B. It appears that present electrical designs have sufficient shock resistance to withstand the effects of the Atom Bomb under conditions existing on this vessel during Test B.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

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.

No damage.

(c) Other damage.

No damage.

II. Forces evidenced and effects noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None

(e) Effects peculiar to the atomic bomb.

None.

III. Results of Test on Target.

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

The test had no apparent effect on the machinery of this vessel, as far as could be determined by visual inspection. No machinery was operated after test B.

There was no electrical damage to affect ship control.

This vessel does not have electric propulsion.

(b) Effect on gunnery and fire control.

There was no damage to electrical equipment that would have had any effect on gunnery and fire control.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

IV. General Summary.

This vessel was beyond the effective range of physical damage from the explosion in test B.

V. Recommendations.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

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

(b) Structural Damage.

No damage.

(c) Other damage.

No damage.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects peculiar to the Atomic Bomb.

None.

III. Results of Test on Target.

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

The test had no apparent effect on the machinery of this vessel, as far as could be determined by visual inspection. No machinery was operated after test B.

There was no electrical damage to affect ship control. The ship does not have electric propulsion.

(b) Effect on gunnery and fire control.

There was no damage to electrical equipment that would have had any effect on gunnery and fire control.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

IV. General Summary.

This vessel was beyond the effective range of physical damage from the explosion in test B.

V. Recommendations.

None.

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.

Structural damage is light. The mast is collapsed and pipe stanchions supporting awnings are distorted. Ruptures are noted in the gun deck where the stanchions are damaged.

(c) Other damage.

No damage to machinery or electrical equipment is apparent from visual inspection.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

There is very little evidence of shock. A light reflector secured to the overhead, centerline at frame 37,jarred loose and fell on the bulb, causing it to shatter.

(d) Pressure.

None.

(e) Effects peculiar to the Atomic Bomb.

None.

III. Results of Test on Target.

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

The test had no apparent effect on the machinery of this vessel, as far as could be determined by visual inspection. No machinery was operated after Test B. There was no electrical damage to ship control. The vessel does not have electric propulsion.

(b) Effect on gunnery and fire control.

There was no damage to electrical equipment that would have had any effect on gunnery and fire control.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None, except for radiological contamination.

(e) Effect on fighting efficiency.

None.

IV. General Comment.

This vessel was beyond the effective range of physical damage from the explosion in Test B.

V. Recommendations.

None.

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.

No damage.

(c) Other damage.

No damage to machinery is apparent from visual inspection. There was no damage whatever to electrical equipment.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects peculiar to the Atomic Bomb.

None.

III. Results of Test on Target.

The test had no apparent effect on the machinery of this vessel, as far as could be determined by visual inspection. No machinery was operated after Test B. There was no electrical damage to affect ship control. The vessel does not have electric propulsion.

(b) Effect on gunnery and fire control.

There was no damage to electrical equipment that would have had any effect on gunnery and fire control.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting effeciency.

None.

IV. General Summary.

This vessel was beyond the effective range of physical damage from the explosion in Test B.

V. Recommendations.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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.

No damage.

(c) Other damage.

None.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

None.

(b) Effect on gunnery and fire control.

None.

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

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

IV. General Summary of Observers' Impressions and Conclusions.

It is considered that this vessel was too far from the center of the blast to suffer damage as a result of this test.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

Twenty four minutes after the burst the LCT 816 was observed alongside the LST 133. The following day it was observed that the craft was down by the stern, and the craft was beached to preclude the possibility of her sinking. When the craft was inspected on the beach 18 days after the test, all engine room spaces were flooded to a depth of about three feet. There is a normal amount of water in the compartments under the tank deck.

(b) Structural damage.

There is moderate dishing of superstructure bulkheads, and handrails are bent. The wooden mast is broken off. Bulwarks are bowed to port about 12 inches.

(c) Other damage.

The electrical equipment and machinery were not operable due to flooding of the machinery spaces. Electrical equipment and machinery outside the machinery spaces suffered no visible damage except that two light bulbs were broken and the starboard side light was shattered, apparently by some water. A dislodged bunk ripped out several lighting cables in the officers' quarters.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

There is no evidence of high blast pressure. There is evidence that a large amount of water struck the craft on the starboard side high enough to damage railings, etc., on top of the pilot house. The craft was thrown about sufficiently to scatter all loose equipment and fittings in the compartments and on the tank deck.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

The spaces housing propulsion equipment were completely flooded, resulting in complete loss of operability.

(b) Effect on gunnery and fire control.

Flooding of the machinery spaces caused loss of all power, but on a ship of this type there would have been no direct effect on gunnery or fire control.

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

Sufficient flooding occurred to require beaching of the craft. It is possible that the flooding of the engine room spaces was caused by opening of shell seams or by leaking stern tubes, but the cause could not be definitely determined. The stability might have been adversely affected, but it is believed that the craft would have been endangered primarily by loss of buoyancy rather than by loss of stability.

(d) Effect on personnel and habitability.

Personnel and habitability would have been adversely affected by radioactivity and the influx of large amounts of water. The loss of power due to flooding would have serious effect on personnel and habitability because of loss of pumping facilities ventilation, lighting and refrigeration.

(e) Total effect on fighting efficiency.

Aside from the effects of personnel casualties, there would have been a moderate loss in fighting efficiency, providing flooding could have been controlled. If flooding could not have beenc ontrolled the efficiency of the craft would have been a total loss.

IV. General Summary of Observers' Impressions and Conclusions.

This ship suffered serious damage to machinery and electrical equipment in Test B, because of flooding only.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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. There was a small amount of normal seepage.

(b) Structural damage.

There is no damage to the principal structure. A stick antennae is bent; the flag bag is displaced, and the port after superstructure handrail is broken and bent.

(c) Other damage.

None.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

A stick antennae is bent and the flag bag is displaced. The force apparently came from a relative bearing of 270 degrees.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

None.

(b) Effect on gunnery and fire control.

None.

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

None.

(d) Effect on personnel and habitability.

None.

(e) Total effect on fighting efficiency.

None.

IV. General Summary of Observers' Impressions and Conclusions.

This ship was at too great a distance from the blast to suffer any damage in Test B.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

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

(b) Structural damage.

No damage.

(c) Other damage.

None.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

None.

(b) Effect on gunnery and fire control.

None.

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

None.

(d) Effect on personnel and habitability.

None.

(e) Total effect on fighting efficiency.

None.

IV. General Summary of Observers' Impressions and Conclusions.

This ship was beyond the range of damage.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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. There was a small amount of normal leakage through stern tubes.

(b) Structural damage.

No damage.

(c) Other damage.

None.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

Although operability tests were not conducted, all machinery and electrical equipment and ships control were apparently unaffected by this test.

(b) Effect on gunnery and fire control.

Gunnery and fire control were unaffected.

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

None.

(d) Effect on personnel and habitability.

None.

(e) Total effect on fighting efficiency.

None.

IV. General Summary of Observers' Impressions and Conclusions.

The distance of this vessel from the blast was too great for damage to occur.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

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.

No damage.

(c) Other damage.

The electrical and machinery equipment suffered no apparent damage.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects peculiar to the Atomic Bomb.

None.

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.

None.

(e) Effect on fighting efficiency.

None.

IV. General Summary.

This ship was beyond the range of damage.

V. Recommendations.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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.

No damage.

(c) Other damage.

The electrical and machinery equipment suffered no damage or loss of operability, either directly or indirectly due to the atom bomb. The two ship's service generators were started and operated with load on the lighting system and ship's service system.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

None.

(b) Effect on gunnery and fire control.

None.

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

None.

(d) Effect on personnel and habitability.

None.

(e) Total effect on fighting efficiency.

None.

IV. General Summary of Observers' Impressions and Conclusions.

This ship was beyond the range of damage, in Test B.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

The engine room had 6-inches of water from normal seepage through stern tubes at a rate of about 3 inches a day. The steering gear compartment was 95% flooded through the rudder glands. The centerline tanks forward of the crews quarters had 1 to 3 inches of water. The port tank just forward of the crews quarters had 12 inches of water. Water in these tanks came from unknown sources.

Flooding is not considered the result of the test. There is no appreciable change in list and trim.

(b) Structural damage.

None.

(c) Other damage.

The electrical equipment suffered no apparent damage or loss of operability, either directly or indirectly due to the atom bomb. None of the electrical equipment had been operated at the time of inspection as the ship's crew had not returned. Although the water in the machinery spaces was not in contact with electrical equipment, some of this equipment undoubtedly is inoperable due to moisture grounds.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

None other than due to possible moisture grounds.

(b) Effect on gunnery and fire control.

None.

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

None.

(d) Effect on personnel and habitability.

None.

(e) Total Effect on fighting efficiency.

None other than due to possible moisture grounds.

IV. General Summary of Observers' Impressions and Conclusions.

This ship was beyond the range of damage to equipment in Test B.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

The vessel capsized as a result of the test. It floated bottom up with the stern awash and the bow four feet out of the water.

(b) Structural damage.

There was no apparent damage to the parts of the hull which were visible.

(c) Other damage.

This vessel was floating bottom side up, inspection of the machinery and electrical equipment was not possible.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None observed.

(d) Pressure.

The wave of water which followed the explosion of the bomb apparently caused the craft to capsize.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

Operability completely destroyed by capsizing.

(b) Effect on gunnery and fire control.

Operability completely destroyed by capsizing.

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

The craft capsized apparently as a result of the wave of water caused by the explosion of the bomb. Since the craft remained afloat until she was destroyed four days after the test, some water-tight integrity remained.

(d) Effect on personnel and habitability.

It is probable that all personnel would have been killed either by the direct effects of the bomb or by drowning. Habitability of the craft is destroyed completely.

(e) Total effect on fighting efficiency.

Completely destroyed.

IV. General Summary of Observers' Impressions and Conclusions.

It is not possible to trace the fate of the LCT 1114 during the first few minutes following the burst. When the Technical Observer in PBM Charlie One came in over the array shortly before 0900 the LCT 1114 was not sighted. At 1150 an object which had previously been noted floating alongside the ARDC 13 was tentatively identified as an LCT floating bottom up. PBM Charlie #2 flying at a lower altitude was able to confirm that the object alongside the ARDC as an LCT floating bottom up.

By the morning of Baker plus One day the LCT 1114 had drifted from the ARDC 13 to a spot between the LST 52 and the LST 661. For the next several days it drifted in a generally westerly direction until it was finally sunk off Amen Island with a demolition charge to prevent it from becoming a menace to navigation.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

The vessel was down by the bow with a slight port list. The forward tanks were flooded full. Flooding of these tanks was the result of previous grounding damage. The #7 centerline tank had 12" of water from an unknown source. There is 3" of normal leakage into the engine space through the stern tubes.

(b) Structural damage.

No damage.

(c) Other damage.

None.

II. Forces Evidenced and Effects Noted.

(a) Heat.

None.

(b) Fires and explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects apparently peculiar to the atom bomb.

None.

III. Effects of Damage.

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

None.

(b) Effect on gunnery and fire control.

No effect.

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

None.

(d) Effect on personnel and habitability.

None.

(e) Total effect on fighting efficiency.

None.

IV. General Summary of Observers' Impressions and Conclusions.

No comment.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

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. There was a slight amount of seepage through the shaft packing gland.

(b) Structural Damage.

None.

(c) Other damage.

None.

II. Forces evidenced and effects noted.

(a) Heat.

None.

(b) Fires and Explosions.

None.

(c) Shock.

None.

(d) Pressure.

None.

(e) Effects peculiar to the Atomic Bomb.

None.

III. Effects of Damage.

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

No effect.

(b) Effect on gunnery and fire control.

No effect.

(c) Effect on watertight integrity and stability.

None.

(d) Effect on personnel and habitability.

None.

(e) Effect on fighting efficiency.

None.

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

None.

V. Preliminary General or Specific Recommendations of Inspection Group.

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

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

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

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

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

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

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

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

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

LST 125
LCI 620
LCT 1187
LCT 1237
LCVP 11

(c) Vessels sunk, or lost:

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

(d) Vessels suffering ramp damages.

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

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

LST 125
LCI 620
LCT 412, 812

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

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

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

LST 125

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

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

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

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

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

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

No heat effects were noted in any landing craft.

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

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

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

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

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

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

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

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

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

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

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

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

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

The YO-160 was sunk in test B. The Technical Observer in PBM Charlie reported at 0908 that he was unable to locate the ship in the array. She does not appear in any photographs taken after the smoke had cleared. At 0950, the Technical Observer officially reported her as sunk.

Part of the YO-160's flooding may have been due to swamping by the descending water column as seen in photographs on pages 13, 14, 15, 16, 17, and 18.

(b) Structural damage.

Unobserved.

(c) Other damage.

Unobserved.

II. Forces Evidenced and Effects Noted.

(a) Heat.

Unobserved.

(b) Fires and explosions.

Neither fire nor explosions were seen.

(c) Shock.

Unobserved except as in photograph on page 12.

(d) Pressure.

The descending water column shown in photographs on page 13, 14, 15, 16, and 17 exerted pressure on the ship's structure, probably damaging superstructure and hull girder. However, no dives were made and no confirmatory information is available. The wave caused by the underwater explosion lifted the YO-160's bow approximately 36' as shown on photographs taken from Enyu.

III. Results of Test on Target.

(a) Effect on propulsion and ship control.

Unobserved.

(b) Effect on gunnery and fire control.

Unobserved.

(c) Effect on watertight integrity and stability.

Both were completely destroyed.

(d) Effect on personnel and habitability.

Unobserved prior to sinking.

(e) Total effect on fighting efficiency.

Completely destroyed.

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

Available sources of information are photographs of burst taken from towers and planes after burst photographs taken of the array from PBM Charlie, the reports of the Technical Observer in PBM Charlie, and the Bureau of Ships Interim Report.

The YO-160 had been severely damaged in test A. Picture showing condition of YO-160 as she floated just prior to test B are shown on pages 7 through 10.

The YO-160 was seen briefly after the inception of the underwater explosion. After the ship was covered by the descending water column and mist she was never seen again.

The photograph on page 11 is the first frame showing the burst. The YO-160 can be seen to the left of the SARATOGA as indicated by the arrow. The photo on page 12 shows the ship engulfed by the shock wave three seconds after the burst. The photograph on page 13, taken 33 seconds after the burst shows the ship partially obscured by the shock wave. Water can be seen starting to fall from the column. The photograph on page 14, burst plus 42 seconds, shows the water column descending on the ship. Photographs on pages 15, 16, 17, and 18 taken at three second intervals after photograph on page 14 show the water column descending on and finally engulfing the YO-160.

V. Preliminary Recommendations.

None.

VI. Pre-test Statistics.

Instructions for loading the vessel specified the following:

Diesel Oil	As desired.
Gasoline	None.
Ammunition	None.
Potable and Reserve Feed Water	95%
Salt Water Ballast	95%

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 Test 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.

The drafts of the YO-160 at time of burst were unknown as no draft marks were fitted. She had no list.

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 damage.

MACHINERY

No comment.

ELECTRICAL

Not observed.

(c) Other damage.

HULL

Not observed.

MACHINERY

Machinery was not inspected, as radioactivity after Test B limited the time personnel could remain aboard YOG 83 to less than 15 minutes per day. A very cursory examination disclosed no apparent damage to machinery. She was sunk by demolition charge after Test B.

ELECTRICAL

Due to the intense radioactivity this vessel was not inspected by the Electrical Group. The Hull Group inspection report indicates no apparent structural damage. The lack of apparent structural damage indicates that electrically the vessel is in essentially the same condition as before Test B.

II. Forces evidenced and effects noted.

(a) Heat.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

Evidence of heat, if any, was not observed as inspection was not made.

(b) Fires and Explosions.

HULL

None.

MACHINERY

No evidence.

ELECTRICAL

Not observed.

(c) Shcck.

HULL

None.

MACHINERY

No evidence from very cursory inspection. See I (c) above.

ELECTRICAL

Evidence of shock, if any, was not observed as no inspection was made by this group.

(d) Pressure.

HULL

None.

MACHINERY

No evidence from very cursory inspection. See I (c) above.

ELECTRICAL

Evidence of pressure, if any existed, was not noted as no inspection was made.

(e) Effects peculiar to the Atom Bomb.

HULL

None.

MACHINERY

High radioactivity.

ELECTRICAL

It being impractical to inspect this vessel after Test B the only known effects apparently peculiar to the Atom bomb was the intense radioactivity.

III. Results of Test on Target.

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

HULL

Not observed.

MACHINERY

Unknown. See I (c) above. Believed to have been none except for radioactivity.

ELECTRICAL

Not known.

(b) Effect on gunnery and fire control.

HULL

Not observed.

MACHINERY

No comment.

ELECTRICAL

Not known.

(c) Effect on watertight integrity and stability.

HULL

None.

MACHINERY

No comment.

ELECTRICAL

Not known.

(d) Effect on personnel and habitability.

HULL

None, except for radioactivity which rendered the barge uninhabitable.

MACHINERY

The craft was made uninhabitable by radioactivity. All personnel would probably have been casualties either from direct effects of the explosion or from radioactivity.

ELECTRICAL

The only known effect on personnel and habitability would have been that due to the intense radioactivity. It is considered this would have been great.

(e) Effect on fighting efficiency.

HULL

Efficiency of the barge was unaffected structurally or mechanically.

MACHINERY

High radioactivity destroyed the usefulness of the craft.

ELECTRICAL

Not known.

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

HULL

No comment.

MACHINERY

YOG 83 is an outstanding example of the seriousness of the radiological aspects of this form of attack.

ELECTRICAL

None.

V. Preliminary General or Specific Recommendations of Inspection Group.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

TECHNICAL INSPECTION REPORT

OVERALL SUMMARY

I. Target Condition After Test.

(a) Flooding, drafts, list.

HULL

When the dock was inspected eight days after Test B, slow leakage was observed through cracks in the underwater body which had resulted from Test A. The rate of flooding was calculated to be approximately 30 percent of that which was observed before temporary repairs were affected after Test A. Two days later the dock capsized as the result of progressive flooding of the port side compartments. After capsizing the dock remained afloat with its starboard forward section above the surface of the water until the dock was sunk by charges on 6 August 1946.

(b) Structural damage.

HULL

During the brief inspection which was possible on this dock, no structural damage incident to Test B was observed. The cracks in the underwater body which were temporarily repaired between Tests A and B were apparently reopened.

MACHINERY

Not observed.

ELECTRICAL

See Hull report.

(c) Other damage.

HULL

Not observed.

MACHINERY

None observed.

ELECTRICAL

It is apparent the damage caused by Test A was not increased as a result of Test B.

II. Forces Evidenced and Effects Noted.

(a) Heat.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

(b) Fires and explosions.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

(c) Shock.

HULL

None observed.

MACHINERY

None observed.

ELECTRICAL

None observed.

(d) Pressure.

HULL

None observed.

MACHINERY

None observed.

None observed.

ELECTROCAL

None observed.

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

HULL

Only effects noted peculiar to the atom bomb were radioactivity and wave phenomena.

MACHINERY

None.

ELECTRICAL

None other than radioactivity and wave phenomena.

III. Results of Test on Target.

(a) Effect on propulsion and ship control.

HULL

Not applicable.

MACHINERY

Test B had no apparent effect on machinery of this vessel as far as could be determined by visual inspection.

ELECTRICAL

None.

(b) Effect on gunnery and fire control.

HULL

Not applicable.

MACHINERY

Not applicable.

ELECTRICAL

Not applicable.

(c) Effect on watertight integrity and stability.

HULL

This dock capsized as the result of progressive flooding of port side compartments and ultimate loss of stability. However, the flooding which occurred was through a leak which was incurred incident to Test A. The rate of leakage was well within the capacity of the pumping equipment installed.

MACHINERY

No comment.

ELECTRICAL

No comment.

(d) Effect on personnel and habitability.

HULL

Except for the effects of radioactivity, it is considered that personnel and habitability would not have been affected by the test.

MACHINERY

None other than the effects of radioactivity.

ELECTRICAL

Except for the effects of radioactivity it is considered that personnel and habitability would not have been affected.

(e) Total effect on fighting efficiency.

HULL

The longitudinal strength, buoyancy, stability, watertight integrity, and seaworthiness of the vessel and the operability of

equipment and machinery apparently were not affected by Test B. This dock was lost as the result of leaving a leaking structure unmanned and untended over a period of time.

MACHINERY

The equipment and machinery of this vessel were not affected by Test B.

ELECTRICAL

There was no apparent damage to the electrical equipment which would impair the operation of this drydock.

IV. General Summary of Observers' Impressions and Conclusions.

HULL

No comment. Additional information on this dock is contained in the Bureau of Yards and Docks Report.

MACHINERY

No comment.

ELECTRICAL

No comment.

V. Preliminary Recommendations.

HULL

None.

MACHINERY

None.

ELECTRICAL

None.

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-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

AD-366705

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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