

U.S.S. CHESTER

BOMB DAMAGE

February 1, 1942

Marshall Islands

Class.	8"-gun cruiser (CA27)	Length (W.L.).	.570'
Launched	July, 1929	Beam66'-1"
Displacement		Draft (mean) on	
(standard). . .	9200 tons	Feb. 1, 1942.	.21'-11"

References:

- (a) C.O. CHESTER conf. ltr. to Buships, CA27/A16-3/(016), Feb. 21, 1942.
- (b) Comdt. N.Yd. Pearl conf. ltr. to Buships, C-L11-1/CA27/NY10(Y-0292), Feb. 15, 1942.
- (c) Comdt. N.Yd. Pearl conf. ltr. to Buships, C-L11-1/CA27/NY10(Y-0468), March 13, 1942.

Narrative

1. U.S.S. CHESTER was near the Marshall Islands (8°-45' N, 171'-33' E) on the morning of February 1, 1942. The sea was calm with a heavy swell. Visibility was clear and unlimited. The ship's speed was 31 knots, and she was turning when attacked.

2. A bomb hit the ship at 0820. It was released from about 1000 feet by an enemy plane diving on the ship at an angle of about 70 degrees. The bomb struck the main deck inboard of the port catapult foundation and exploded on impact. Photos 1 to 4, taken soon afterwards, show the general nature of the damage.

3. It is estimated in reference (a) that the bomb was 12 inches in diameter and weighed 134 lbs. There is little information on Japanese bombs available in the Bureau. It appears that there are at least two 60-kilogram types in use, filled with picric acid, T.N.T., or a mixture of hexa-nitro-diphenylamine and tri-nitro-anisol. The charge weight is probably about 85 to 90 lbs.

4. The fragments averaged one-half to one inch in maximum dimensions, and most of them travelled nearly parallel to the deck. Fragmentation of the bomb was evidently excellent. Several travelled over 100 feet: through the 10-lb. and 7-1/2 lb. plate of the wardroom pantry to dent the 10-lb. forward bulkhead of the wardroom at frame 42.

5. Two small fires broke out. One, in the wash deck gear locker in the port side of the uptakes at frame 60, was extinguished at once. The other was in the forward engine room exhaust ventilation trunk which runs up the inboard side of the port catapult foundation. It was fed by the one-inch cork sheathing of the trunk. No appreciable damage was done and the fire was soon extinguished.

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6. The hole in the main deck was temporarily patched by the ship's force (Photos 5, 11 and 12), using 10-lb. plates welded in place. The deck was shored up where weakened by bent stanchions and damaged framing so that the planes could be safely trucked across it. Permanent repairs were made at the Navy Yard, Pearl Harbor, as reported in reference (c).

7. Evidently there was a near miss aft, according to information received from the Navy Yard, Pearl Harbor. Fragments struck the after port searchlight, the starboard side of 8-inch gun mount #3, and pierced the after bulkhead of the direction finder control room.

Structural Damage
(see next section for fragment damage)

Main deck and above

8. The explosion blew a jagged hole of about 36 square feet in the 10-lb. main deck plating, and destroyed about 60 square feet of the 2-inch teak deck; see Photos 1 to 4 and Plate I. The catapult foundation (20 lbs. medium steel) was dished in a foot and torn over a distance of two feet. The watertight door to the workshop in the outboard side of the catapult foundation was blown off its hinges, but probably was not fully dogged down (if at all). The catwalk on the catapult was blown loose.

9. The after side of the intake trunk to No. 2 boiler room (frame 63, Photo 8) was dished just above the main deck, to a maximum of 3 inches. The umbrella plating was torn loose, and was removed before Photo 8 was taken. Two ventilation trunks in the intake blower room collapsed and were torn loose from their brackets.

10. Ventilation opening covers to the forward engine room intakes were bent (frame 74, Photo 7). Expanded metal screens in intake openings were blown away in the catapult foundations, port and starboard, and in the intakes at frames 74 and 63; see Photos 5, 7 and 8 (these screens have been replaced in Photo 7).

11. The 10-lb. bulkhead of the flag office at frame 51, forecastle deck, was slightly dished. This was about 60 feet from the explosion, and can be seen in Photo 9.

Second deck:

12. The 80-lb. S.T.S. armored second deck was slightly dished beneath the point of explosion, between frames 67 and 70. This is indicated by an arrow on Photo 10. Insulation on the underside of this deck, in the forward engine room, was loosened.

13. Web frames 67 and 70 (18 by 6-1/2-inch I beams with 12-1/2-lb. webs) were slightly buckled, and supporting stanchions were buckled; see Photos 10 to 13. Longitudinal framing (8 by 3-inch channels) was distorted, and one riveted to a trunk at frame 68 was torn loose as shown by Photo 10.

14. The 7-1/2-lb. bulkhead at frame 64 was slightly buckled. The plating of the trunked access to the engine room was slightly distorted, and the door in it was sprung.

15. Piping broken in way of the hole in the main deck at frame 68 included a two-inch fresh water main, two steam heater lines, and ventilation ducts. Numerous electrical leads were cut at this point, including the power lead to the port catapult, a welding lead, and ship's service telephone lines.

16. The inclined ladder leading from the center of main deck down to C-201-L was torn loose from its toggle pins.

Fragment Damage

17. The damage caused by the bomb fragments was severe. It all occurred above the main deck, and extended from frame 43 to frame 93, a distance of 100 feet forward and aft of the explosion. As mentioned in paragraph 4, most fragments travelled nearly horizontally, and exhibited considerable penetrating power. The principal fragment damage is marked on Plate I. The following tabulation covers the main items of interest. Structural plating which was penetrated was medium steel in all cases, so far as can be ascertained from plans readily available in the Bureau.

<u>Damage</u>	<u>Location</u>	<u>Distance from burst, feet</u>	<u>Remarks</u>
20-lb. plating of port catapult foundation riddled	Frame 68 Main deck	5	See Photos 2 to 5. Fire started in exhaust vent trunk.
10-lb. partition bulkhead inside catapult foundation pierced in 7 places	Frame 68 Main deck	7	These fragments pierced 30 lbs. of plating in all.
20-lb. plating of starboard catapult foundation pierced	Frame 68 Main deck	35	A few holes up to 9 ft. above deck.
10-lb. W.R. pantry bulkhead pierced in about 10 places	Frame 50 Main deck	72	These fragments travelled farthest in the ship. Some casualties in ward-room.
7-1/2-lb. W.R. pantry bulkhead pierced in about 10 places	Frame 48 Main deck	80	
10-lb. W.R. bulkhead dented in about 13 places	Frame 43 Main deck	100	

<u>Damage</u>	<u>Location</u>	<u>Distance from burst, feet</u>	<u>Remarks</u>
17-1/2-lb. plating of port tripod mast leg pierced in numerous places	Frame 53	60	See Photo 9. Electric leads inside the mast leg were cut.
Flag office bulk-head punctured, 9 places	Frame 51, fore-castle deck	68	See Photo 9.
Windscreen of navigation bridge dented	Frame 55	65	
Casing of forward stack punctured	About Frame 60	40	See Photo 8. Path inclined upward about 45 degrees.
Lockers along port side of boiler casing	Frames 56 to 62	See Plate I	Fire started in wash deck gear locker.
7-1/2-lb. vent trunk plating punctured	Frames 74, 63 and vicinity	30	See Photos 7 and 8. There were numerous holes in such plating around the main deck in the vicinity.
10-lb. plating of 5-inch ammunition hoist punctured	Frame 89 Main deck	84	Presumably the port hoist was the one damaged.
Aviation office workshop punctured	Frame 87 Mezzanine deck	76	These fragments travelled farthest aft in the ship, passing through the port hangar. An aircraft engine was hit. Galley equipment was damaged.
Crew's galley bulk-head punctured	Frame 89 Main deck	84	
Intake trunk to after engine room dented	Frame 91 Main deck	92	
Outboard side of starboard hangar, scored and pitted	To Frame 83, Main deck	72	
Motor whale boat gashed in numerous places.	Port davits	28 to 52	See Photo 9.
Whale boat, minor penetrations	Starboard davits	50	

18. Practically all rigging in the vicinity was cut by fragments, including:

- (a) the airplane handling crane whip and pendant,
- (b) towlines and inhauls of both cast recovery sleds,
- (c) the port life lines,
- (d) both falls of the motor whale boat, and
- (e) the after fall of the starboard whale boat.

19. Nearly all electric wiring in the vicinity of the hit was cut. The degaussing cable (which is run in the waterways on CHESTER) was cut in three places near frame 70, and at one place in the athwartship lead at frame 52. Wires in the port leg of the mainmast were cut; see the tabulation in paragraph 17.

20. Miscellaneous equipment was also damaged by fragments, including fire hoses, fog nozzles, oil hose and CO₂ extinguishers. Piping cut by fragments included fire main risers to two plugs on the main deck, the air line to 5-inch gun number four (this gun is on top of the hangar at frame 87), the air line to the incinerator at frame 89 (in the port hangar), and a drain line at frame 53 on the forecastle deck.

Discussion

21. This incident illustrates the type of damage which can be expected from relatively light, instantaneously-fuzed fragmentation bombs. The danger zone has a radius of about 100 feet, and most fragments will be confined to a relatively narrow horizontal band. There will not be much dispersion in a vertical sense. The average medium steel structure within the danger zone will be penetrated. Near the outer limits of the danger zone, however, even light medium steel affords protection against some fragments which would otherwise cause serious or fatal injuries. Within 30 feet or so, risk to personnel is not diminished but rather increased if men throw themselves flat on deck; this is clear from the fragment penetrations shown in Photos 7 and 8.

22. Fragments will start fires. They will also damage mains, plugs, hose, nozzles and fire extinguishers in the vicinity. Fire fighting equipment on exposed decks should therefore be shielded as much as arrangements permit.

23. Extensive damage to electric leads and piping may be expected from fragments. This bomb did relatively little direct structural damage, but damage to systems rendered the catapult inoperative, put the degaussing out of action, cut the air to one gun, cut telephone lines and cut leads to instruments in the fore top.

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