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B.R. 1736 (22) (B)
C.B. 4499 (B)

TIRPITZ

An account of the various attacks
carried out by the British Armed
Forces and their effect upon the
German Battleship

Volume 2

EVIDENCE FOR DETAILED
ACCOUNTS OF DAMAGE

1948

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BR 1736 (22) (B)

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An account of the various
attacks carried out by the Post
armed force, and their

effect upon	the German
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EVIDENCE FOR DETAILED
ACCOUNTS OF DAMAGE

ADMIRALTY,
31st March, 1949.

P.03370/47

~~C.B. 4499(B)~~ ^{B.R. 1736(22)(B)} Tirpitz—*An account of the various attacks carried out by British Armed Forces and their effect upon the German battleship, Volume 2. Evidence for detailed accounts of damage, 1948, having been approved by My Lords Commissioners of the Admiralty is promulgated for information and guidance.*

By command of Their Lordships,

J. G. Lang

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GRADING OF N.I.D. REPORTS

The following is an explanation of the system of grading intelligence reports:-

Letter A indicates a highly probable report
 " B " a probable report
 " C " a possible report.

As regards the figure numbers which follow the letters, 1 indicates a report confirmed by other reports and at the other end of the scale 5 indicates an improbable report.

SECTION I - SOURCES OF INFORMATION

1. Naval Intelligence Division (N.I.D.), Admiralty.
2. Bomber Command.
3. Admiral (Submarines)
4. A.C.I.U. Interpretation Reports.
5. Air Warfare and Flying Training Division (A.W.D.), Admiralty.
6. Interrogation of Fregatten-Kapitän (Ing.) Eichler at the German Admiralty (O.K.M.), Eckernförde, on 17th May and 8th June, 1945. Eichler was Engineer Officer of TIRPITZ from June, 1942, until October, 1944.
7. Interrogation of Kapitän zur see Junge at Kiel on 11th June, 1945. Junge was Second-in-Command of TIRPITZ from September, 1943, until 3rd April, 1944, and Commanding Officer from the latter date until the ship capsized.
8. Interrogation of Kapitän zur see Reinecke on board Prinz Eugen at Wilhelmshaven on 17th July, 1945. Reinecke was Chief-of-Staff to the German Flag-Officer, Polar Coast, from March, 1943, until January, 1944.
9. Interrogation of Korvetten-Kapitän (Ing.) Hielscher on board Prinz Eugen at Wilhelmshaven on 18th July, 1945. Hielscher was on the Staff of SCHIFFSMACHINERIEINSPEKTION at Wilhelmshaven from March, 1940, until March, 1943.
10. Interrogation of Konter-Admiral Peters at the Torpedo Experimental Establishment at Eckernförde on 22nd July, 1945. Peters was Kapitän zur see Commanding U-Boats in Norway from January, 1943, until June, 1944. He was promoted to Konter-Admiral in June, 1944, and from that time until October, 1944, was Flag Officer of the 1st Battle Group in Norway, comprising TIRPITZ and her escort of six destroyers.
11. Survey of wreck of TIRPITZ at Tromsø between September and October, 1945. (Supervised by D.N.C.'s Officers - see Appendix B of Volume I).

NOTE. The interrogations were carried out by the following representatives of D.N.C. :-

- 6 & 7 - Constructor Commander N. Hancock, R.C.N.C. and Sub Lieut. E.A. Steane, R.N.V.R.
- 8 & 9 - Sub. Lieut. E.A. Steane.
- 10 - Constructor Lieut. K.G. Evans, R.C.N.C. and Sub. Lieut. E.A. Steane.

SECTION 2. - F.A.A. ATTACK OFF LOFOTEN ISLANDS ON 9TH MARCH, 1942

2.1 Extracts from Appendices I and II of a report of the attack given by the Commanding Officer of H.M.S. VICTORIOUS (Letter No. 0190/3116 of 15th March, 1942)

1.1 Extract from Appendix I

Narrative (All times Zone 1)

1.1 At 0645/9 six Albatrosses were flown off for search on tracks 105 degrees to 155 degrees to a distance of 150 miles. Twelve Albatrosses, armed with torpedoes, were then ranged. These were flown off as a striking force at 0735, with orders to make good a track of 135 degrees true and act on any intercepted enemy reports. At 0800 search aircraft Duty F sighted the TIRPITZ and two minutes later made the first report. From then onwards TIRPITZ was continuously shadowed and reported, all reports being received by the Striking Force Commander who adjusted his course to intercept.

1.2 At 0842 the Striking Force sighted TIRPITZ (accompanied by one destroyer) at a range of 20 miles and closed to attack.

1.3 TIRPITZ took violent avoiding action and no hits were observed.

1.4 Two shadowing aircraft made contact with an ARADO Seaplane and one shadowing aircraft was attacked and the Observer wounded by an unidentified aircraft, possibly a JU 87. The Striking Force met no air opposition.

1.5 Two aircraft were lost in the attack, probably from close-range fire. One was seen in the water after the attack. The other was not seen after the dive to attack. Enemy gunfire was not on the whole effective and had little influence on the results achieved.

1.6 All the remaining aircraft returned to the ship without difficulty and were landed on by 1043.

Remarks on the attack

1.7 The approach was made up-wind and TIRPITZ was steaming up-wind. In these conditions aircraft only closed her at some 30 knots. The striking force, however, came out of the clouds astern of her and both the leading sub-flights attacked the port side. TIRPITZ was thus able to turn to port under full wheel to comb the tracks and so forced the two rear sub-flights (coming in on the starboard side) to make a long leg into the wind to get into a favourable position for dropping. This delayed their attack till about 5 minutes after the port sub-flights and gave TIRPITZ time to reverse her wheel and comb the second lot of torpedoes.

1.8 Only one of the torpedo cameras produced a photograph, but this showed that the range of dropping was one thousand yards in excess of the pilot's estimate. It is therefore probable that all aircraft were deceived by TIRPITZ large size and dropped their torpedoes at too great a range.

1.2 Extract from Appendix II

Report of attack

2.1 Wind - 35 knots, 070 degrees; sky-cloud 7/10 at 2,000 feet; sea - rough 4.5; visibility - extreme above clouds, 25 miles except for occasional snow showers below clouds.

2.2 TIRPITZ was accompanied by one destroyer of the HANS LODY class. Course of enemy on sighting by striking force 080 degrees speed 28 knots, and destroyer

SECTION 2 - F.A.A. ATTACK OFF LOFOTEN ISLANDS ON 9TH MARCH, 1942 (Cont'd)

was stationed about 2 miles 180 from TIRPITZ. Reports received indicated that TIRPITZ was on a course of 040 and interception course was steered by A.S.V. On sighting it was seen that TIRPITZ was steering 080 at about 26 knots. The wind was 35 knots from 070 degrees. The speed of the aircraft was 90 knots making a rate of overtaking the enemy by the striking force some 30 knots.

2.3 The order to deploy was given shortly after first sighting and because of low rate of closing this was 28 minutes before the attack took place. The leading sub-flight came to a large gap in the cloud and observed TIRPITZ close on the starboard bow. Fire was opened by TIRPITZ after a brief interval. The order to attack was passed and a shallow dive was commenced and continued till the most favourable dropping position was reached. The leading sub-flight attacked on the port bow. The leading sub-flight did not observe any avoiding action, the second sub-flight observing the avoiding action attacked in the best position on the port quarter. TIRPITZ made a large alteration, estimated at 100 degrees to port which was very soon altered to starboard. The intention of the 3rd and 4th sub-flights was to synchronize and attack from ahead. As, however, the rate of closing was low, and owing to the avoiding action taken, these two sub-flights were unable to attack as intended. The second wave's attack was delivered approximately 5 minutes after the first from a position on the starboard bow, with TIRPITZ swinging rapidly to starboard.

2.4 The torpedoes ran correctly as far as could be seen, no hits were observed and there was no reduction of speed or other signs of damage to the enemy. There was an increase in what was considered to be funnel smoke. Torpedo speed and depth setting were 40 knots and 25 feet respectively, Duplex pistols set to "Impact" were used.

2.2 Captured German Documents. (Extract from report N.I.D.24/T.67/45)

The following report includes a brief summary of the action taken from the TIRPITZ' Daily Log.

2.1 In the morning of 9.3.1942, the TIRPITZ was proceeding on her return journey to Vestfjord after failing to locate and attack a British convoy off South Norway. At 0800 the "Ihn" closed the TIRPITZ in position 68 degrees 15 mins. N. 10 degrees 44 mins. E, in order to carry out anti-submarine protection on her starboard bow.

2.2 At 0910 two aircraft, thought to be "Fairey Albacores", were sighted by the TIRPITZ on her starboard quarter at a distance of about 21,700 yards and then a third thought to be a reconnaissance aircraft was sighted on a bearing of 210 degrees. According to a message sent out by the British and picked up by the ship's 'Y' service at 0955, the true position of this aircraft was 20 nautical miles west of this bearing. It was presumed that the reconnaissance aircraft was locating and maintaining contact with the TIRPITZ and directing the torpedo-carrying aircraft on to their target.

2.3 At 0931 the TIRPITZ was proceeding on course 130 degrees at 27 knots, and a minute later she flew off her ship-borne aircraft as a defence measure against submarines and aerial attack. At 0934 she altered course to 82 degrees and increased speed to 29 knots.

2.4 At 0942 the starboard watch were called to "Action Stations" and the ship reported ready for action.

2.5 At 0958 a further aircraft was sighted on a bearing of 205 degrees and identified as carrier-borne.

2.6 At 1015 TIRPITZ was attacked from both sides by about 25 Swordfish torpedo-bombers. They approached at about 3,000 feet, dived to 100-200 feet,

SECTION 2. - F.A.A. ATTACK OFF LOFOTEN ISLANDS ON 9THE MARCH, 1942 (Cont'd)

and dropped their torpedoes at a range of 400 to 1200 yards from the ship. A few approached to about 200 yards before dropping torpedoes. The attack was made in waves of 3 to 6 aircraft. The first wave flew in at medium height on the port quarter and, after being engaged by the A.A. armament, opened up into a widely spaced formation and flew from side to side across the ship as she manoeuvred away from their attacks. The attacks were skilfully executed. After dropping torpedoes, the aircraft attacked the bridge with machine guns.

2.7 At 1020 a hydrophone contact was obtained of a torpedo to port, and this was followed from a bearing of 220 degrees, across the stern, to 170 degrees. 30 Seconds later a torpedo was detected on the starboard bow and another on 90 degrees and followed round to 180 degrees. Further contacts of torpedoes increased on both sides and were finally detected round the entire horizon. It was impossible to take accurate bearing or to locate separate torpedoes owing to the close range at which they were dropped and to their sound. The aircraft dropped two torpedoes each, and several tracks were seen visually and avoided - one was seen to pass by parallel to the starboard bow, about 10 yards off. 3 Aircraft were shot down, 2 to starboard and one to port. A further aircraft flew away on fire and several more left trails of smoke behind them as they flew off lurching heavily.

2.8 The following ammunition was expended by the TIRPITZ during the action:-

10.5 cm.	-	345 rounds
3.7 cm.	-	897 rounds
2 cm.	-	3372 rounds
15 cm.	-	12 nose fuze

16 rounds of barrage ammunition
2 rounds of long-range barrage ammunition

2.9 After a short engagement to port in controlled fire, the main A.A. armament engaged on both sides in barrage fire.

2.10 The light A.A. armament was engaged on both sides.

2.11 No damage was inflicted on the TIRPITZ by torpedoes.

SECTION 3. - BOMBER COMMAND ATTACK AT FOETTEN FJORD ON 31ST MARCH, 1942

3.1 Information supplied to D.N.C. by Bomber Command

1.1 "TIRPITZ was attacked whilst lying close to the cliff at her moorings in Foetten Fjord, she was covered by a smoke screen. Thirty-four aircraft set out upon the operation but only one of them attacked the ship. The following were dropped:-

4,000 lb. bombs fused instantaneous	- 1 in No.
500 lb. G.P. bombs probably fused	
.1 sec. delay	- 4 in No.

1.2 The smoke screen rendered the attack abortive".

SECTION 5. - BOMBER COMMAND ATTACK AT FOETTEN FJORD ON 29TH APRIL, 1942

5.1 Information supplied to D.N.C. by Bomber Command

1.1 "TIRPITZ was attacked whilst lying close to the cliff at her moorings in Foetten Fjord; she was covered by a smoke screen. Thirty-four aircraft set out upon the operation, thirty attacked the ship. The following were dropped:-

4,000 lb. bombs fused instantaneous	- 18 in No.
500 lb. G.P. bombs probably fused .1 sec. delay	- 23 " "
250 " " " " " " " "	- 1 " "
1,000 " Mines, Mk.XIX, fused hydrostatic 30 feet	- 48 " "

1.2 Results were not observed".

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON
22ND SEPTEMBER, 1943. ("OPERATION SOURCE")

6.1. Interim information of the attack and its results. (Supplied by N.I.D.
on 8th February, 1944)

1.1 Attack

(a) Position of Charges:

Four charges were released in the following positions:

- (i) Abreast the bridge,
- (ii) Abreast the bridge,
- (iii) Under the funnel,
- (iv) Under the after turrets.

Only two exploded, probably those at (i) and (iv).

(b) Size of Charges: Two tons of amatex each.

(c) Depth of water: Eighteen fathoms

(d) Distance of charges from the ship: It is not known at what distance from the ship the charges exploded. It has, however, been reported that a column of water was thrown up which did not wet the deck of the ship. It therefore seems probable that the charge at (i) exploded at a distance of at least fifty yards from the ship's side. The other charge may have been nearer.

1.2 Established Damage

- (a) Damage to the forward turret machinery,
- (b) To the turbo-generator room, from which the lighting failed,
- (c) To the after turret machinery,
- (d) To the upper deck aft.
- (e) Big leakage of oil forward and entry of water aft.

1.3 Temporary Repairs

One repair ship went alongside TIRPITZ the day after the attack, but did not apparently carry out much work.

Two further ships arrived at the end of November, 1943. One was a repair ship and the second carried workmen and special equipment and remained in Alten Fjord as an accommodation ship.

By the end of December, 1943, the holes had been filled with cement and the battleship was lying on even keel at normal draught.

Early in January she fired her main armament, possibly only the forward turrets, which caused further leakage.

At the beginning of February work was still in progress and a raft with superstructure was present. This has been variously described as a floating power plant, a raft for divers, and a crane.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

1.4 Selected Reports on Extent of Damage

- ✓ (i) Ship lifted five feet by explosion. (B.2)
- ✓ (ii) Immediately after the explosion the lights failed, but were soon restored. (B.2)
- ✓(iii) The ship took on a list to port, which had been righted by trimming the next morning. (B.2)
- (iv) Photographic reconnaissance showed 'A' and 'X' turrets trained as for de-ammunitioning. (A.1)
- (v) Gun turrets damaged, all guns being out of alignment. (B.2)
- (vi) Upper bridge awry, after guns rendered unusable. (C.3)
- (vii) Side armour torn. (B.2)
- (viii) Two holes in starboard side. (B.3)
- (ix) Hit amidships and has hole on waterline about seven metres (23 feet) in length. (C.3)
- (x) Holes made watertight with cement. Welding under water in progress(B.2)
- (xi) 22,000 bags of cement used to stop leaks. (B.3)
- (xii) After practice firing (probably early January) further leakage and more work in progress. (B.2)
- ✓(xiii) Electrical generating unit damaged. (B.2)
- (xiv) December: Germans admit they are trying to drag for parts of lighting installation. (B.3)
(N.I.D. Comment - More probably for sunken midget)
- ✓(xv) Lighting system affected. (B.2)
- (xvi) Mid November: Lighting plant not functioning. (C.3)
- (xvii) Lighting system in order early January (B.2).
- (xviii) Engine room area particularly badly damaged; ship unable to move under her own power. (C.3)
- (xix) Engineers and stokers among casualties. (C.3)
- (xx) Shaft tunnel stove in in parts. (B.2)
- (xxi) By mid-December engines had been turned over, but were not in working order. (B.2)
- (xxii) Three engines were destroyed. (B.2)
- ✓(xxiii) Bulges and dents visible in deck aft. (B.2)

✓ From more than one source.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

- 6.2. Further Information of the attack and its results (supplied by N.I.D. on 28th February, 1944)
- 2.1 Position of Charges: As in I (a) and (d). (See Section 6.1.1)
- 2.2 No explosions: As in I (a). (See Section 6.1.1)
- 2.3 Observations of spray: N.B. One of anchors thrown up on deck (B.2)
As in I (d). (See Section 6.1.1). Explosion on port side flung up gigantic column of water about as high as the mast. (B.2)
- 2.4 Time of day: 0930/22.9.43 (German time)
- 2.5 Damage to deck aft:
- (i) No damage visible except for dent in after deck. Welding shed built on after deck. (B.2. 21.12.43)
 - (ii) No damage visible except for bulge in after deck. (B.2 end 12/43).
 - (iii) On after deck especially large dents and bulges (C.3, November, 1943).
 - (iv) Welding hut and another smaller shed erected on after deck (B.2, 6.2.44).
 - (v) Aft of after turret wooden hut has been erected. (B.2, 2/44)
 - (vi) Welding in progress on deck. (Russian recco. 23.12.43)
- 2.6 (iii)
- (i) Now lying with forward part low in the water (B.2, 29.9.43)
 - (ii) Ship at first had heavy list, which has now been righted. (B.2, 10.11.43)
 - (iii) TIRPITZ has now been pumped out and is lying at normal draught. (B.2, 18.12.43).
 - (iv) On even keel at normal draught (B.3, 24.12.43)
 - (v) After attack TIRPITZ had list to port. Righted again next morning. (B.2)
 - (vi) Ship has been lightened about 2 metres (6.6 feet) and has a list to port. (22/11, C.3)
 - (vii) After attack TIRPITZ had list to port.
 - (viii) Immediately after attack took on slight list. (B.2)
- 2.7 (iv): As it stands.
- 2.8 (v) and (vi)
- (i) Has not fired guns, which she did regularly before. (B.3, 24.12.43)
 - (ii) Gun mountings and turrets badly jarred. (B.2, 30/12)
 - (iii) Leakage recurred when guns were fired 10/1 (B.2)
 - (iv) On 13/1 exercises with guns, but so far no firing. Guns seem to rotate normally (B.3, 16/1).

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- (v) Upper bridge awry; guns on after ship rendered unusable. (C.3
November, 1943)
- (vi) TIRPITZ has had shooting exercises. First fired with one main gun forward, then both in forward turrets together. After this began to leak again. (B.3, 1.2.44)
- (vii) Guns out of action and could not be trained. All secondary armament to be remounted on wooden fundamentals. Size of box 7 feet to 8 feet. Forward main turrets seen being swung, after ones covered with tarpaulin. (December 1943, B.3)
- (viii) Four main turrets put completely out of alignment and it cost weeks of work to get them lined up again, by oil pressure. Sub-calibre shooting carried out in December (B.2)
- 2.9 (viii), (ix), (x), (xii)
- (i) Two holes in starboard side (B.3, 28/11).
- (ii) Holes have been stopped with cement. (B.3, 24/12)
- (iii) Holes filled in with cement. (B.2)
- (iv) Holes filled with cement, but leakage when guns were fired. (B.2)
- (v) Watertight with cement, but after practice firing leakage occurred and repair work still in progress. (B.2 10/1)
- (vi) Hit amidship - has hole on waterline about 7 metres (23 feet) long. (C.3, November, 1943)
- (vii) 22,000 bags of cement used to stop leak. (B.3 31/1)
- (viii) Leakage again after firing (B.3)
- (ix) Several tears in hull, where welding of armour plating has been forced open. (B.2)
- 2.10 (xviii), (xix), (xx), (xxi), (xxii)
- (i) TIRPITZ has probably been badly damaged in her engine room. (B.2 10/11)
- (ii) Starboard main engine completely destroyed. All main engines useless. (B.3, 28/11)
- (iii) Her engines have been turned over, but are not in working order. (B.2, 18/12)
- (iv) Improbable that engines have been turned. Has not been under way (B.3, 24/12).
- (v) Three of engines were destroyed. (December, B.2)
- (vi) Smoke from funnels. (30/12, B.2)
- (vii) Engine room area particularly badly damaged. Ship unable to move under her own power. Engineers and stokers among casualties. (November 1943, C.3)
- (viii) Second explosion aft, in engine room. Engines badly displaced, now being dismantled, and will be remounted. (6/2, B.2)

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

- (ix) Propeller and rudder damage (6/2, B.2)
- (x) TIRPITZ had steam up on 9/2. Her safety valves lifted. Not yet underway. (B.2, 9/2).
- (xi) Much damage to TIRPITZ' engines, many parts require to be replaced. Not thought they can be done in Kaa Fjord. (December 1943, B.2).
- (xii) One of shaft tunnels stove in (B.2)

2.11 Supplementary information on repairs in progress

- (i) A 20-ton crane arrived on 1/2. Erected on float on starboard side. On shore between TIRPITZ and quay welding of an enormous tank of iron and steel plates. (B.2, 4/2)
- (ii) Floating crane in Kaa Fjord. (February, B.2)
- (iii) Only one floating crane of about 20 tons capacity has so far been seen in Kaa Fjord. (A.2, 15/2)
- (iv) Large diving bell being built at Naval workshop at Kaa Fjord. Will be used for removing propellers and rudder. Will be constructed so that it can be fastened to the hull aft. (B.2, 6/2)
- (v) Tank is to be lowered into the water and adjusted over damaged portion so that one can work inside it. Large tube has been constructed down which workmen are to be lowered. (B.2, 9/2)
- (vi) Unconfirmed report that anchor windlass or winch out of action. Possibly the large floating crane will be able to get anchor up. (10/2, C.3)
- (vii) Large iron tank which has been under construction on shore inside where ship is lying is obviously a cofferdam that is to be attached to the ship's side and made watertight in order to carry out welding and repair work inside. (B.2, 16/2)
- (viii) Tank which is some 4 metres (13.2 feet) long in its biggest dimension launched on 16/2 and submerged alongside TIRPITZ' port quarter some 25 metres (83 feet) forward of her stern on 17/2. It is damage to her rudder which is being repaired. (B.2, 18/2)
- (ix) Large floating crane has been towed to TIRPITZ (B.3, 26/1)

6.3. Minutes of a Meeting held at D.N.C. Department, Bath, 28th February, 1944, to discuss the damage to TIRPITZ

3.1 There were present

Mr. V.G. Shepheard (Chairman)	}	representing D.N.C.
Mr. F.S. Sutherby		
Eng. Rear Admiral A.G. Crousaz	}	representing E. in C.
Cdr. (E) A.J.H. Goodwin		
Mr. W.C.M. Couch	}	representing D.E.E.
Mr. J.E. Shaw		
Mr. A.P. Cole (D.N.C. Dept.)		representing Admiralty Shock Committee

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Capt. (E) H.J.B. Moore	}	representing D.N.O.
Cdr. (E) G.C. de Jersey		
Captain A.J. Mitchell		representing D.T.M.
	and	
Captain J.G. Godwin, R.M.		representing N.I.D.

3.2 D.N.I's representative produced additional and more detailed information which had been requested as a result of a preliminary meeting held at Bath on 16.2.44.

3.3 It was agreed that the existing evidence as to the number of charges fired or their positions relative to the ship was not sufficiently reliable to form the basis of a damage assessment. It appeared probable that the damage was mainly on the port side and that two distinct explosions occurred, one approximately abreast the bridge and the other probably abreast or just abaft 'Y' turret.

3.4 Armament It would appear that 'A', 'B' and 'C' turrets were probably not seriously damaged, but the absence of evidence as to any movement of 'D' turret, or of firing its guns, suggested that this turret or the adjacent structure might have been damaged. There is not sufficient evidence available on which to base an opinion as to whether 'D' turret can be put in working order whilst the ship is at her present base. It is unlikely that any serious damage was caused to the secondary or A.A. armaments.

3.5 Electrical equipment. It was considered unwise to assume on the evidence that the electrical equipment had been seriously damaged or was not now in good working order.

3.6 E. in C. asked for details of casualties. N.I.D. stated that reports were not definite but had included references to dead bodies being taken ashore. It was observed that in our experience shock from underwater explosions did not, in general, cause fatal casualties. The point was considered important and N.I.D. promised to communicate further details.

(Note: This information has since been received from N.I.D., but it does not add materially to the information available at the meeting).

3.7 Machinery

7.1 On the assumption that the explosive used in the ground mine which damaged BELFAST was comparable in power with Amatex, E. in C. stated that at 50 yards from the ship some damage, not necessarily serious, would be expected to the machinery; at 68 feet the damage would be expected to be serious. The conflicting intelligence reports did not allow an opinion to be formed as to the severity of the damage.

7.2 It was considered that the repair work which had apparently been done since September would not have been undertaken if the main engines were so seriously damaged as completely to immobilise the ship. It appeared probable that the damage was principally confined to the shafting, and that the Germans anticipated being able to get at least one set of machinery and shafting in working condition, which would enable the ship to steam south to a repair yard.

3.8 Hull

8.1 As stated in D.N.C's remarks on N.I.D.01117/44, it is considered that the damage forward was probably not serious and was likely to comprise dishing and minor splits in the shell plating, strained seams etc., which would

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

account for leakage of oil. It is probable that there would also be minor shock damage to equipment which possibly has been put right by this time.

8.2 The evidence that leaks in watertight structure are being made good by cement appears to be well authenticated. This indicates that temporary repairs only are being carried out at Kaa Fjord and that it is the intention that the ship should be steamed south for permanent repairs. It is unlikely that the Germans would risk fighting an action with the ship in this condition.

8.3 The additional evidence as to the damage to the deck aft was considered important as suggesting that buckling had occurred in way of the after cut-up due to whip of the extreme after end. This would be expected to be associated with buckling of the shell plating, which would cause heavy vibration when under way unless the longitudinal strength is restored by repairs. The reports of welding aft were consistent with structural repairs of some magnitude which may, however, be soon completed.

8.4 The report, from several sources, that a cofferdam has been made and fitted to the port quarter, indicates that underwater structural repairs are being undertaken, probably in the region of the port stern tube. From this it would appear that there is a prospect of the port machinery being made serviceable.

3.9 Conclusions

9.1 It was agreed that, after careful consideration of the evidence, it could be reasonably inferred that (A) hull repairs of some considerable extent have been undertaken; (B) such repairs would not have been undertaken if the main engines were damaged beyond repair with local facilities; (C) the enemy hope to make one or more shafts workable to permit the ship to steam to a dockyard for permanent repairs; (D) the ship would not be fully effective for operations without permanent repairs.

9.2 In response to a request by D.N.I. on 8th February, 1944, for an estimate:-

- (i) of time necessary to complete temporary repairs in North Norway for passage south
 - (a) under her own power,
 - (b) assisted by tugs.
- (ii) as to whether TIRPITZ can be made fully effective without coming south to a main yard, and, if so, probable date of completion of repairs.

If not

- (iii) of date of becoming fully effective after completion of repairs at a main yard,

it was agreed that the evidence justified replying:-

- "(i) (a) It appears to be the intention to complete temporary repairs for passage south under own power but an estimated date of completion cannot be given; assuming recent reports that a cofferdam is being fitted are reliable mid-March appears to be the earliest date when such a move could be made;
- (b) It is considered unlikely that the assistance of tugs would be required unless a breakdown occurs during passage;

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- (ii) Refit at a main yard is essential to make ship fully effective;
- (iii) On the scanty evidence available it seems unlikely that the ship could be made fully effective in less than 3 months at a main yard.

3.10 Further action

10.1 It was suggested that if any further reliable evidence became available, e.g. training of 'D' turret, removal of cofferdam, welding huts or cranes, or arrival of more floating plant, it might be possible to give more precise answers to N.I.D's enquiries."

6.4. Extract from preliminary report of the attack given by Admiral (Submarines). (Letter No. 192/SM.04351 dated 2nd February, 1944).

4.1 Three X-craft, X.5 (Lieutenant H. HENTY CREER, R.N.V.R.), X.6 (Lieutenant D. CAMERON, R.N.R.), and X.7 (Lieutenant B.C.G. PLACE, D.S.C., R.N.), failed to return as a result of the operation, and, while it was known that one or more of these craft succeeded in carrying out a successful attack on TIRPITZ, at the time of my previous report no information was available as to which of the craft had succeeded in this daring attack, nor were there details of how it was accomplished.

4.2 It was the intention of each of the three Commanding Officers, all of whom had TIRPITZ as their target, to close the entrance to KAA FJORD at first light on the morning of the 22nd September, having fully charged up their batteries during the night. Having negotiated the A/S net at the entrance to KAA FJORD they would attack TIRPITZ by passing under the A/T nets surrounding her, drop their charges set to detonate at approximately 0830 G.M.T., and then retire to seaward, hoping to be well clear of the fiord by the time of the explosion.

4.3 P.R.U. photographs had shown that the close A/T nets around TIRPITZ consisted of three lines of nets. (See Section 6.12 for details). The flotation indicated that the nets were for anti torpedo protection, and it was considered unlikely that they would reach the bottom in the depth of water, twenty fathoms. In fact it was estimated they would only extend downwards about fifty feet.

4.4 From the information received, the following is a reconstruction of the movements of these three X-craft in their attacks.

X.6 (Lieutenant D. CAMERON, R.N.R.)

4.5 At some time unknown the periscope of X.6 became flooded. The Commanding Officer was therefore completely "blind" with no means of conning his craft when dived.

4.6 Having negotiated the A/S net at the entrance to KAA FJORD and entered the fleet anchorage, Lieutenant CAMERON, with a complete disregard for danger, proceeded on the surface in broad daylight astern of a small coaster through the boat gate entrance in the nets, situated only two hundred yards away from TIRPITZ. After passing safely through the entrance on the surface X.6 dived, and steering straight for TIRPITZ, proceeded to attack.

4.7 X.6 had, however, been sighted from TIRPITZ off the port bow, as Lieutenant CAMERON must have realised that he would be. The time of sighting is reported as 0800 G.M.T. The alarm was raised, and hand grenades thrown at him from the deck of TIRPITZ, and a pinnace started to drop depth charges.

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4.8 Lieutenant CAMERON continued to carry out his attack, and on passing under the bridge of TIRPITZ, he probably released one charge. Having passed under the ship, X.6 failed to turn to starboard in time, and ran into the nets on the starboard side of TIRPITZ before he could carry out the second run of the attack. Finding himself foul of the nets he was obliged to go astern to clear himself, and in so doing went astern into TIRPITZ. Lieutenant CAMERON, realising that he had been sighted, released his second charge, and surfaced his ship almost alongside the TIRPITZ. He then saw all his crew safely out of the craft before scuttling her.

4.9 Lieutenant CAMERON and the crew of X.6 (Sub. Lieutenant J.T. LORIMER, R.N.V.R. Sub Lieutenant R.H. KENDALL, R.N.V.R., E.R.A.4 E. GODDARD, C/MX.89069) were picked up and taken on board, the time being then approximately 0805.

X.7 (Lieutenant B.C.G. PLACE, D.S.C., R.N.)

4.10 In the meantime X.7 had also attacked. Proceeding according to plan X.7 penetrated safely past the A/S nets at the entrance to the fiord, and Lieutenant PLACE decided to attack by passing under the close A/T nets. Here he met unexpected difficulties, for instead of the expected gap under the nets he found that they extended to 120 feet, which, with a depth of water of only twenty fathoms, meant that the nets were almost, if not quite, down to the bottom.

4.11 Lieutenant PLACE was not to be deterred, and at the third attempt he managed to work X.7 along the bottom under the nets to carry out a successful attack, dropping one charge under the funnel and one under the after turret. In negotiating the A/T nets he was able to ascertain its details, which were fine wire 4" mesh - a most formidable type of A/T net.

4.12 Having completed the attack undetected, PLACE was then faced with the difficulty of getting through under the nets again to make his escape. To add to his difficulties the tide was by then ebbing, which meant that the nets would be even nearer to the bottom than before. Once again X.7 found herself foul of the nets; and as they were only 170 feet from TIRPITZ and from the line on which the charges had been laid, and with the time for the explosion drawing nearer every minute, the feelings of those on board while they were struggling to extricate themselves may well be imagined. As it was, X.7 cleared the nets with only a few minutes to spare, as at 0830, when the explosion took place, she was only some 400 yards to seaward of the nets.

4.13 Even at this distance the force of the explosion so damaged X.7 that she was put out of action, and Lieutenant PLACE decided to remain on the bottom for the next hour and await events. Around about 0930, when depth charges were being dropped indiscriminately about the fiord, although they did no damage to the craft, Lieutenant PLACE realised that owing to damage sustained nothing further could be done and that the operation was by now compromised. He therefore decided to surface the craft to give his crew the chance of escaping. X.7 was brought to the surface, but was immediately hotly engaged by gunfire and sunk. PLACE was left swimming when she sank, and Lieutenant AITKEN, the 3rd Officer, escaped by using D.S.E.A. Of the other two members of the crew nothing is known, nor; apparently, have their bodies been discovered.

X.5 (Lieutenant H. HENTY-CREER, R.N.V.R.)

4.14 The information so far available is insufficient to show what part X.5 took in the attack. Wreckage, presumably from this craft, was discovered by divers either on the day of or the day after the attack, about one mile to seaward of TIRPITZ' berth, about halfway between TIRPITZ and the entrance to KAA FJORD. Some of the wreckage from this craft was also flung to the surface. No bodies or personal gear have been found, and there is no knowledge of any survivors from X.5.

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4.15 X.5 may therefore already have attacked and laid her charges and have been on the way out when depth-charged and destroyed, or she may have been waiting to attack at the next attacking period after 0900.

Salvage of craft

4.16 X.7 was salvaged eight days after the attack, being recovered from a position some 400 yards off the starboard bow of TIRPITZ, outside the nets. She was taken in tow and beached in KAA FJORD. The whole of her bow was missing, probably caused either by the gunfire or depth charges.

4.17 Although divers made a thorough search, no signs of X.6 could be found inside the A/T nets, and it is presumed that she was totally destroyed by the explosion, which must have taken place very close to where she was scuttled.

4.18 The wreckage of, presumably, X.5 was found, as previously stated, about a mile to seaward from TIRPITZ, but there was insufficient of the craft left to make salvage worth while.

Damage to TIRPITZ

4.19 The explosive charges (of which at least two detonated, the others possibly being destroyed by their close proximity to each other) badly buckled and possibly holed the hull in two places, causing flooding and loss of oil fuel. The harbour boiler and turbo generator rooms were affected, with consequent effect on the lighting system and forward turret machinery. Damage aft was also caused and one report states that all four turrets were damaged, the guns put out of alignment, and that the shaft tunnel was stove in in parts.

4.20 A further report assesses the damage as follows:-

"The upper bridge is away and the guns aft rendered useless. On the after deck, especially, there are large dents and bulges. The engine room area was particularly badly damaged."

(The fact that a large proportion of the 50-60 victims among the crew, who were later buried on Norwegian soil, were engineers, stokers, etc., seems to confirm this statement).

4.21 Several hundreds of workmen have been transported to ALTEN FJORD to effect temporary repairs with the aid of repair ships which have been seen alongside, and there is a repair hut on deck, and welding is in progress. On 10th January, 1944, a 100 foot raft with superstructure had been towed alongside, apparently for divers.

4.22 It would appear conclusive that TIRPITZ has sustained considerable damage to the hull, machinery and armament as a result of the attack. Temporary repairs are still being carried out in KAA FJORD which it is estimated will not be completed for a further one or two months, and the ship cannot be made effective for prolonged operations without docking at a German port.

6.5. Extract from final report of the attack given by Admiral (Submarines). (Letter No. 1098/SM.04351 dated 26th July, 1945.)

5.1 With the return from Germany of the Commanding Officers of X.6 (Lieutenant D. Cameron, V.C., R.N.R.) and X.7 (Lieutenant B.C.G. Place, V.C., D.S.C., R.N.), and the receipt of their patrol reports, together with the release of certain information from captured German documents (notably the

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deck log of TIRPITZ and portions of the German High Command War Diary), it has become evident that some of the information and many of the inference contained in my predecessor's submission No.192/SM.04351 of 2nd February, 1944, were, in fact, incorrect. The following is the sequence of events from the time of slipping the X-craft from their parent submarines to the conclusion of the attack.

5.2 20th September, 1943. (All times are G.M.T.)

All three X-craft slipped from their towing submarines between 1845 and 2000, all being in good heart and trim. X.6's starboard charge had flooded since 11th September, but experiments with stores and spare gear had put the ship into a working trim, provided that the inland waters of the fjords were sufficiently saline. The minefields reported off SOROY were negotiated on the surface successfully, although X.6 sighted a patrol vessel at 2200. At 2315 X.7 sighted another X-craft, and exchanged shouts of good luck and good hunting. Although not definitely identified, the other X-craft was certainly X.5. X.5 now, unfortunately, passes out of the picture until her sighting and destruction on 22nd September.

5.3 21st September

3.1 X.6 and X.7 both dived between 0145 and 0215, each finding trimming difficult. During the passage through STJERNSUND, X.7 had to dodge several vessels and X.6 started a defect on her periscope which was to prove a major handicap throughout, but a triumph of mind over matter by her crew.

3.2 The advance through the fjords toward the agreed waiting and charging positions in ALTEN FJORD went according to plan, neither X-craft experiencing any difficulty in the calm weather prevailing, and at 1245 X.7, taking advantage of a freshening breeze, was able to ventilate the boat through the induction trunk. An occasional A/S patrol vessel, and a solitary aircraft had to be dodged, but at 1630 X.7 sighted a large vessel in the lee of AAROY Is. This vessel is noted in X.7's report as "believed to be SCHARNHORST", and was thereafter disregarded. All thoughts were centred on TIRPITZ, which, under Plan No.4, was the target for X.5, X.6 and X.7.

3.3 X.6 was first into her waiting billet, arriving at 1845 1 mile North of BRATTHOLM where she spent a rather disturbed night, charging, making good defects (particularly to her periscope) and dodging traffic. This traffic became so trying that the Commanding Officer surfaced to continue his charge at 2145, endeavouring to make contact with other X-craft during the night. On inspecting the clock settings of his fuzes at 2300, it was discovered that the port (unflooded charge) clock was defective. To guard against any hold up, both 10 point plugs were released and the charges set to fire at one hour from release.

3.4 X.7 had also reached her waiting position and spent the night charging and making good defects. Among this "making good defects" was the fitting of the spare exhaust pipe, the discovery that it did not fit, and its eventual "make do and mend" with the aid of tape, canvas and chewing gum. X.7 also suffered some inconveniences due to small boats and minor war vessels.

5.4 22nd September

Phase I

4.1 X.7 left the lee of the BRATTHOLM group of Islands at 0045 to commence the penetration of the known and unknown defences of KAA FJORD, followed an hour later by X.6; neither boat having made friendly contact during the night. Operationally such contact was not necessary and it had not been allowed for in the plan. At 0340, X.7, first in the field, straightened up for the

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entrance through the A/S boom defence gap at the entrance to KAA FJORD and by 0400 was through, only to be put deep by an M.L. outward bound. As a result of this temporary blindness X.7 got caught in the unoccupied square of A/T nets, once used to house LUTZOW, but now empty. X.6, following later, and having increasing trouble with her periscope, dodged a small ferry boat and an A/S patrol vessel and at 0505 also passed through the A/S boom gap.

4.2 Meanwhile, life in KAA FJORD in general and TIRPITZ in particular, pursued its normal course. Hands were called, normal A/A defence and anti-sabotage watch ashore and afloat was set, the boat-gate in the A/T nets was opened for boat and tug traffic, and the hydrophone listening office ceased work, all at 0500.

Phase II

4.3 X.6, suffering from a flooded periscope, went to 60 feet to strip and clean it, while proceeding by D.R. towards the Western end of the fjord. On coming to periscope depth again she found she was so close to NORDMARK that she had to alter course to avoid the mooring buoy. To add to her difficulties, the periscope again clouded over and the periscope hoisting motor brake burnt out resulting in manual control of the brake being necessary when raising or lowering the periscope. By 0705 X.6 had closed the A/T shore net defence of TIRPITZ and was through the boat entrance, and within striking distance of the target.

4.4 X.7 having got caught in the unoccupied A/T defences in the middle of the fjord spent a busy, if cautious, hour in getting clear at the expense of breaking surface, unseen, and putting the trim pump out of action. The violent action required to break free of the nets also put the gyro compass off the board. By 0600, having had another incident with a wire across the periscope standard, X.7 was clear, though precariously trimmed at periscope depth, and headed for the target. At 0710, having decided in favour of passing under the TIRPITZ A/T net defences, X.7 endeavoured to do so at 75 feet and got caught.

4.5 Up to this point no suspicions had been aroused in TIRPITZ and normal harbour routine was in progress.

Phase III

4.6 After passing through the gate X.6 ran aground on the North shore of the enclosure and broke surface. This was observed in TIRPITZ but, although reported as a "long black submarine-like object", there was a five minute delay passing the information on to higher authority as it was thought that the object sighted might be a porpoise. Five minutes later, X.6, in backing and filling to get clear of the ground and to get pointed in the right direction to close TIRPITZ, again broke surface about 30 yards abeam of TIRPITZ and was sighted and correctly identified.

4.7 X.6 by this time had no gyro compass, as this had been put out of action by the grounding and subsequent violent angles on the boat, and the periscope was almost completely flooded. She was therefore taken blindly in what was imagined to be the target's direction, hoping to fix her position by the shadow of the battleship. After five minutes X.6 got caught in an obstruction which she took to be the A/T net on the far (starboard) side of TIRPITZ, but which was probably something hanging down either from TIRPITZ or one of the craft alongside. Lieutenant Cameron straightened his craft up, manoeuvred clear of the obstruction, and surfaced close on the port bow of TIRPITZ, when a brisk fire from small arms and hand grenades was opened on the submarine. The submarine was too close to the ship for any of the heavy A/A or main armament to bear.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

4.8 Realising that escape was hopeless, Cameron destroyed the most secret equipment, backed his craft down until the stern was scraping TIRPITZ' hull abreast 'B' turret, released his charges and scuttled the craft. X.6 started to sink as a power boat from TIRPITZ came alongside, picked off the crew of four and vainly attempted to take X.6 in tow, but X.6 followed her explosives to the bottom.

4.9 On board TIRPITZ and in KAA FJORD the alarm had now been properly raised, and it is clear from the entries in the battleship's log that complete surprise had been achieved by our forces. Although the first sighting had been made at about 0707 (a note in the log states that times between 0705 and 0730 are inaccurate) it was not until 0720 that the order was given to close watertight doors, and the A/A guns' crews closed up. A power boat "manned by one officer and equipped with hand grenades" left the ship at about 0715, and was the one which took off the crew of X.6, having used her hand grenades, happily to no effect. Action stations were sounded, steam raised and the ship was prepared for sea, in order to get her outside the nets. This order was apparently not given until 0736, when watertight doors were reported closed. Divers were ordered to go down to examine the hull for limpet mines, but it appears that some form of charge dropped under the ship was also expected, as the extract from the log recording the preparations for sea reads "in order to leave the net enclosure if possible before the time-fuzed mines detonate". Destroyers in the fjord had also raised steam, and were requesting depth charges.

4.10 While TIRPITZ was making up her mind how to deal with the situation, X.7, so far unseen but stuck in the nets ahead of TIRPITZ, was trying to extricate herself. The following is taken from Lieutenant Place's report:-

"September 22nd.

"... 0710. Set both charges to one hour and released ten pin plugs. Went to 75 feet and stuck in the net. Although we had still heard nothing it was thought essential to get out as soon as possible and blowing to full buoyancy and going full astern were immediately tried. X.7 came out but turned beam on to the net and broke surface close on to the buoys, going astern to the Northward.

We went down again immediately but had to go ahead towards the net to avoid catching our stern and the boat stuck again by the bow at 95 feet. Here more difficulty in getting out was experienced, but after about 5 minutes of wriggling and blowing X.7 started to rise. The compass had, of course, gone wild on the previous surface and I was uncertain how close to the shore we were; so the motor was stopped and X.7 was allowed to come right up to the surface with very little way on. By some extraordinary lucky chance we must have either passed under the nets or worked our way through the boat passage, for on breaking surface the TIRPITZ, with no intervening nets, was sighted right ahead not more than 30 yards away. 40 feet was ordered and X.7, at full speed, struck the TIRPITZ at 20 feet on the port side approximately below 'B' turret, and slid gently under the keel where the starboard charge was released in the full shadow of the ship. Here, at 60 feet a quick stop trim was caught - at the collision X.7 had swung to port so we were now heading approximately down the keel of TIRPITZ.

"Going slowly astern the port charge was released about 150 to 200 ft. further aft - as I estimated, about under X turret. I am uncertain as to the exact time of release, but the first depth charges were heard just after the collision, which, from Lieutenant Cameron's report would fix the time at 0722.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

"After releasing the port charge, 100 feet was ordered and an alteration of course guessed to try and make the position where we had come in. At 60 ft. we were in the net again. Without a compass I had no exact idea of where we were, the difficulties we had experienced and the air trimming had used two air bottles and only 1200 lbs. were left in the third. X.7's charges were due to explode in an hour - not to mention others which might go up any time after 0800.

"A new technique in getting out of nets had by this time been developed. The procedure was to go full ahead blowing economically and then go full astern, the idea being to get as much way on the boat as the slack of the nets would allow and thus have a certain impetus as well as the thrust of the screws when actually disengaging from the net. In about the next three quarters of an hour X.7 was in and out of several nets, the air in the last bottle was soon exhausted and the compressor had to be run. Once at about 40 ft. 0740, X.7 came out while still going ahead and slid over the top of the net between the buoys on the surface. I did not look at the TIRPITZ at this time as this method of overcoming net defences was new and absorbing, but I believe we were at the time on her starboard bow - we had certainly passed underneath her since the attack. We were too close, of course, for heavy fire but a large number of machine gun bullets were heard hitting the casing. Immediately after passing over the nets all main ballast tanks were vented and X.7 went to the bottom in 120 ft. The compressor was run again and we tried to come to the surface or periscope depth for a look so that the direction indicator could be started and as much distance as possible put between ourselves and the coming explosion. It was extremely annoying to run into another net at 60 ft. Shortly after this there was a tremendous explosion (0812). This evidently shook us out of the net and on surfacing it was tiresome to see the TIRPITZ still afloat - this made me uncertain as to whether the explosion we had just heard was our own charges or depth charges, so X.7 was taken to the bottom....."

4.11 This last excursion into the nets was apparently well on TIRPITZ' starboard bow and from outside. After getting clear X.7 sat on the bottom to survey the damage. Compasses and diving gauges were out of action but there appeared to be little structural damage. The boat was impossible to control, however, and broke surface on several occasions. On each occasion fire was opened on her from TIRPITZ, causing damage to the hull, and finally it was decided to abandon the boat. X.7 was brought to the surface rather than use D.S.E.A., owing to the depth charging that was being experienced. The boat surfaced close to a target allowing Lieutenant Place to step on to it, but before the remainder of the crew could escape, X.7 sank at 0835. Sub-Lieutenant Aitken was able to get out by the use of D.S.E.A. at 1115, but no trace was discovered of the remaining two members of the crew. Both Lieutenant Place and Sub-Lieutenant Aitken were brought on board TIRPITZ and well treated, as had been the crew of X.6.

4.12 The first knowledge on board TIRPITZ that more than one midget submarine was attacking came at 0740, when X.7 was seen just outside the A/T nets, having made her escape after dropping her charges. Hand grenades were thrown, fire opened from the 2 cm. and 3.7 cm. armament, and aircraft made ready to take off and carry out a search. As other craft were outside the nets in unknown numbers, it was decided not to take TIRPITZ out of the enclosure, so the gate was shut, and the ship moved as far away from the position in which X.6 had sunk by heaving in on the starboard cable and veering port. This brought the bows away from both of X.6's charges and the first of X.7's, but left X.7's second charge still under the engine-room; those on board TIRPITZ being unaware that a second attack had been carried out.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

4.13 TIRPITZ' log records at 0812 "two heavy consecutive detonations to port at 1/10 sec. interval." "Ship vibrates strongly in vertical direction and sways slightly between the anchors." The first explosion abreast Section VII ('X' turret) about 6 to 8 yards away from the ship, the other 50 to 60 yards off the bow in the position where X.6 sank.

4.14 The weight of the charge was estimated at 900 lbs., whereas, in fact, each of the four charges weighed 2 tons. It is not clear from this how many of the three charges laid off the port bow actually went off, although subsequent examination of the sea-bed failed to discover any of the charges, or even fragments. It seems likely therefore, that all four charges detonated completely and that only the action to move the bows of the ship bodily to starboard on her cables saved her from far worse damage and even, perhaps, from destruction.

4.15 Before dealing with the damage resulting from the attack it remains to be recorded that at 0843 a third X-craft was sighted some 500 yards outside the nets. TIRPITZ opened fire and claims to have hit and sunk this X-craft. Depth charges were also dropped in the position in which the craft disappeared. This was X.5 (Lieutenant H. Henty-Creer, R.N.V.R.) which had last been seen off SOROY on 21st September by X.7. Nothing is known of her movements, nor was any member of her crew saved.

6.6. Interrogation of Fregatten Kapitän (Ing.) Eichler

6.1 He said that TIRPITZ was attacked on the 22nd September, 1943, when lying in 35 to 40 metres (115 to 132 feet) of water by midget submarines. Out of six boats despatched to make the attack, only three reached Kaa Fjord and only one of these reached the ship. This craft released one charge under the port forward turbine room, was detected while manoeuvring to release the second charge and attacked with 20 mm. machine gun fire and hand grenades. She released her second charge about 60 metres (approx. 200 feet) from the fore end of TIRPITZ. Shortly afterwards the crew of four left the submarine and were taken on board. The German crew of a pinnace which had been used in the hand grenade attacks tried to beach the craft by towing, but it sank in deep water. The other two midgets did not find TIRPITZ and were sunk some distance away from her outside the torpedo nets. He said that all three craft had since been lifted and thoroughly investigated and that each boat carried two charges of about 1,000 Kgm.

6.2 The charge laid forward did little damage but caused slight flooding.

6.3 The charge under the machinery spaces produced a large tear about 8 metres (26.5 feet) long and smaller splits, in the bottom plating. Double bottom compartments from stations 68 to 112 and from the port side of the ship to the middle line generally and to 16 feet starboard of the middle line between stations 75 and 98, were open to the sea. In addition No.2 diesel generator room was open to the sea and the port and centre engine rooms and No. 1 diesel generator room were subjected to controllable flooding. All turbine feet, plunger-blocks, thrust blocks, etc. were distorted or cracked, as a result of which the shafts could not be turned. The diesel generators in the flooded compartment were also severely damaged by shock. All turrets, particularly 'C' and 'D' main armament turrets, jumped out of their seatings and turret clips were stretched. Range finders and other optical equipment were severely damaged and needed replacement. All pipes including condenser inlets and outlets in the damaged area, were subjected to shock. The repairs were commenced in October, 1943, and finished in March, 1944, just before the Fleet Air Arm bombing attack.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

6.7. Interrogation of Kapitän zur see Junge

7.1 This Officer, who was Second-in-Command of TIRPITZ at the time of the attack, said that she was attacked by three midget submarines and that complete surprise was achieved. At the time TIRPITZ was lying at the end of Kaa Fjord and was completely surrounded on the sea-side by torpedo nets. The first he knew of the attack was a report that a submarine of some sort was touching the torpedo net. Shortly after this he saw a submarine surface on the port side of the ship inside the net. A second boat surfaced and was observed outside the net. He ordered an immediate alarm. As they had no depth charges he sent a small boat under the command of a lieutenant, armed with hand grenades which were dropped where the submarine was thought to be. As a result of this action one boat surfaced and the crew of four men got out. The submarine afterwards sank although the German lieutenant tried to tow it ashore. After this event the officers in TIRPITZ did not know what to expect. They thought that attacks with torpedoes, mines or limpet mines might develop. They tried to clear any of the latter which might have been attached to the ship by pulling a wire strop, slung around the ship, from bow to stern. At the same time they made preparations to get underway but ultimately decided to stay put because they did not know what form of attack was waiting for them outside the nets.

7.2 In view of the fact that a submarine which might have laid mines had been known to sink off the port bow, action was taken to move the bow of TIRPITZ to starboard by tightening the starboard mooring cable and slackening the port cable. Shortly after this a heavy explosion took place. Later he discovered that two separate explosions had occurred at approximately the same time, apparently from ground mines, the depth of water being about 40 metres (132 feet). A tremendous shudder passed through the ship and the bow lifted violently. As a result, 65 men were wounded by concussion and there were 7 cases of broken skulls. The outer bottom plates were not badly ruptured but were bent and split in several places. The inner bottom was also damaged and longitudinals were buckled. Only one hold compartment flooded, viz. the port diesel dynamo room in Section VIII of the ship, because the hull and fire pumps could not be started at the time, but the compartment was later pumped out.

7.3 Shock put all electrical gear out of action, including the eight diesel generators in the two rooms in Section VIII and switchboards were damaged by shock. All turbine holding-down bolts were elongated or cracked. Many bearings of the main shafts and auxiliary machinery were fractured. As a result, all three shafts were out of action but the damage to the port shaft was most severe. This damage was repaired during the winter months in Alten Fjord. The splits in the hull were repaired by building a caisson around each hole and pumping out the compartment.

7.4 It was discovered that the midget submarine, the crew of which had been captured, had gained access to the anchorage through the gate in the torpedo boom when it had been opened to allow access to a supply ship. As a result of this the boom around TIRPITZ was always kept closed and a temporary bridge was built between TIRPITZ and the shore to bring stores aboard.

6.8. Interrogation of Kapitän zur see Reinecke

8.1 The first indication to the crews of TIRPITZ that an attack was taking place was about 0713, when a small craft, identified as a submarine (X.6), was observed to break surface momentarily inside the net enclosure. The submarine alarm was sounded, watertight openings were closed to action state and the A.A. guns were manned.

8.2 The submarine surfaced again a few minutes later and was attacked with 20 and 37 mm. fire from TIRPITZ and with hand grenades thrown from a power-boat.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

The use of larger guns against the submarine was prohibited owing to its proximity to the battleship and to attendant craft alongside. The submarine submerged but shortly afterwards was brought to the surface by her crew and abandoned in a sinking condition. The power boat endeavoured to tow the craft, which was thought to contain explosives, away from TIRPITZ but she sank some 50 to 60 yards off the port bow after being towed only a short distance.

8.3 The existence of X-Craft was known to the Germans, but there was no information as to their armament. Upon the identification of the submarine attacks by any one or more of torpedo, mine and charges attached to the hull, were expected. To combat the first two, it was decided to move TIRPITZ from the anchorage and orders were given to raise steam and prepare to get under way. In an endeavour to detect charges that may have been attached to the hull, the latter was probed with long poles and a cable was passed under the ship from port to starboard and dragged along its length.

8.4 Meanwhile, about 0740, another submarine (X.7) broke surface twice off the starboard bow, just outside of the net enclosure. This craft was attacked with 20 and 37 mm. fire and several hits were scored. The submarine dived but its wake was easily seen and destroyers were ordered to launch their motor boats, equipped with depth charges, and to attack. Before this action could be put into effect, however, the submarine surfaced and a man climbed out on to a target; the submarine then sank with its hatch still open.

8.5 As a result of the detection of the second submarine, the orders given for moving TIRPITZ from the anchorage were cancelled as it was thought there was too much risk of other submarines lying in wait for an opportunity to carry out a torpedo attack. Instead, action was taken to move the bow as far as possible from the position in which the first submarine (X.6) sank by paying out the port forward cables and hauling in on the starboard forward cables. (See Fig.3, Volume I).

8.6 At 1012 two huge explosions occurred at about one-tenth of a second interval, one under Section VIII and the other under Section XX. The ship gave a tremendous shudder and was lifted bodily; the movement of the fore end was particularly violent. The depth of water beneath the ship varied from about 115 to 130 feet.

8.7 About 1040 a third submarine, outside the net defence, broke surface. This craft was immediately attacked with fire from various guns on TIRPITZ and a number of hits were scored. It disappeared in a steep dive and was considered to have been sunk.

8.8 The following damage and flooding was caused:-

Hull Splits and dishing occurred in the shell plating forward and in way of engine rooms; one split was about 26 feet long. Intakes between outer and inner bottoms were damaged.

Flooding Uncontrolled flooding occurred in double bottom compartments in sections VII to X, mainly on the port side, and also in the sail store on the middle platform deck, Section XXII. Controlled flooding occurred in Sections VIII to X in the port and centre engine rooms, No.2 dynamo control room and No. 1 diesel generator room, and in Section I in No.2 steering gear compartment.

Machinery The three propulsion units were put out of action as a result of damage caused to all the turbine bearings and to the fracture of turbine feet and holding down bolts.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

Armament The armament was unaffected. The 15-inch rangefinder just abaft the main mast was thrown out of its support and various gun and rangefinder sights were damaged.

Electrical Electric failures occurred immediately after the explosions, but supplies were quickly restored by emergency machinery. Severe damage was caused to diesel generators - bedplates and holding down bolts were fractured and only two out of eight generators remained serviceable.

Communications W/T aeriels were broken and equipment damaged.

8.9 Repairs were effected by April, 1944.

6.9. Interrogation of Korvetten Kapitän (Ing.) Hielscher

9.1 This Officer confirmed the information given in the above statements. In addition he stated that the turbine rotors were also damaged and that all electric supplies in the ship failed immediately after the explosion. Although emergency lighting functioned the normal supply took two or three hours to restore. The time for repairs would have been considerably curtailed if some of the important damaged machinery items had not been found extremely difficult to replace.

6.10. Interrogation of Konter-Admiral Peters

10.1 Complete surprise was achieved by the X-Craft. The attack was facilitated by the gates in the boom defence at the entrance to the Kaa Fjord, and in the protecting nets around TIRPITZ, being open at the time to allow passage for store craft re-victualling the battleship. No anti-submarine listening or other detection devices were in use.

10.2 There were two underwater explosions, both to port of the ship. One occurred about 10 feet from the side forward and the other about 30 to 50 feet from the side amidships. TIRPITZ was lifted bodily and violently shaken.

10.3 The following damage was caused:-

Hull Splits and dishing occurred in the shell plating forward and in way of the Engine Rooms. The damage forward was of a minor nature.

Machinery Major shock damage was caused to Engine Room equipment. The three main engines were put out of action through fracture of turbine bearings, casings and holding down bolts. Plummer-blocks were strained.

10.4 The battleship was repaired in the Kaa Fjord, the work taking six months to complete.

6.11. Captured German Documents (Extract from report N.I.D.24/T.30/45)

"BRITISH MIDGET SUBMARINE ATTACK ON TIRPITZ, 22ND SEPTEMBER, 1943.

11.1 According to a report made by Marinegruppenkommando Nord to the German Naval War Staff on 22nd November, 1943, it was stated that, as a result of the successful midget submarine attack on heavy units of the Battle Group (Kampfgruppe), the battle-cruiser TIRPITZ had been put out of action for months. It also stressed the importance of the defensive counter-measures necessary to ward off further attacks of this nature.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

11.2 The extent of the damage caused in this attack is outlined in

- (a) the TIRPITZ War Diary of 22nd September, 1943, and
- (b) comments of Battle Group on 30th September, 1943,

translations of which are given below.

(a)

22.9	Kaa Fjord Wind 3 - 5, 8/10 cloud, visibility good, barometer 987,0 mb, + 4.6°	Boom-gap open to boat and tug traffic Hydro-phone office manned until 0700. Restricted A/A watch at stations. (Main- tains sabotage guard both on shore and sea according to orders)
0905 to 0910 (times up to 0930 inaccurate)		Report from N.C.O. - Long black sub- marine like object momentarily sighted on the port beam inside the net enclosure, approximately 20 m. from shore. Slight delay (about 5 minutes) in reporting to First Lieutenant and Gunnery Control Officer, as it was at first presumed to be a porpoise.
0910 to 0915		Approximately 60 m. to 80 m. on the port beam midget submarine identified surfac- ing for a moment by several of the crew. Power boat lying at the gangway cast off for action, manned by one officer and equipped with hand grenades.
0920		Close watertight doors. A/A watch closed up.
0920		Submarine again sighted about 50 m. from ship's side, heading for turret A. Power boat throws hand grenades. Use of A/A guns prevented as submarine too close and craft and tug alongside.
0925 to 0932		Submarine surfaced about 50 m. off the port bow. The submarine has a deck 12 m. long, 1 m. wide and raised 50 cm. above the pressure hull. Its main fittings are a periscope, a conning with conning tower hatch and a glass dome similar to that of an aircraft, as well as an attack periscope. The pressure hull seems to extend 2 m. forward and aft of the casing. Estimated size 30 to 50 tons. The craft is very much down by the bow. Immediately after surfacing the conning tower hatch is lifted, four members of the crew climb out, give themselves up and are taken over by the power boat, while the latter takes the submarine in tow at the same time. As, however, the bottom Kingstons are obviously open, the submarine cannot be kept afloat and sinks about 50 m. off the bow after being towed for 20 m.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

- 0936 (Pencil comment in margin) Water-tight doors closed.
After 16 minutes (0920-0936)
If order "Stand to" had been Judging from the attitude of the
given, 16 minutes would have prisoners who were brought on board,
been gained for getting up } it is estimated that the boat has
steam. } already completed the operation.
Therefore, examination of ship's hull
begun and order given to prepare for
sea with utmost speed, in order to
leave the net enclosure, if possible,
before the time-fuzed mines detonate.
- 0940 A second midget submarine on the star-
board bow outside the net enclosure
close to the crossbolt (Querriegel)
sighted for a moment and fired at by
2 cm. and 3.7 cm. Hand grenades
thrown from the forecastle. Patrol
vessels "Z.27" and "Z.30" request
depth charges. Ship's aircraft
ordered to prepare for A/S duty.
Hands ordered to close W/T doors as
for action stations. Boom gate of
net enclosure closed by tug.
- (Pencil note - 20 minutes
after "Close watertight
doors" 0920 - 0940)
- As there is at least one more submarine outside the net enclosure,
leaving the net enclosure is out of the question. It must be taken
into account that explosives may detonate at any moment inside or
close to the sunk submarine. To move the bows further away from the
place of sinking, order is given to veer the port cable as far as
possible, and heave in on the starboard chain
- 0946 Second submarine on bearing 000
to degrees to 030 degrees, about 50 m.
1002 the other side of the crossbolt of
the net enclosure, surfaced twice
and was fired at. Hits probably
scored.
- 0956 (Pencil note - After 16 min. Ship ready for sea.
0940 - 0956)
- 1001 Signal sent out 0931/m.
"Priority. Addressed to Skl.
(German Naval War Staff), Gruppe
Nord/Fleet, Admiral Nordmeer,
Admiral Polarküste from Battle Group:-
Midget submarine sunk 0930 inside
TIRPITZ net enclosure. Four British
taken prisoner. Further report
follows".
- 1012 Two heavy consecutive detonations to
port separated by a fraction of a
second abreast Section VII, 6 to 8 m.
from the ship's side and 50 to 60 m.
off the bow (place of sinking of
first submarine). Ship vibrates
strongly in vertical direction and
sways slightly between the anchors.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

(Pencil note:- 0920 - 1012,
52 minutes after first
counter-measure.)

Depth of water at detonation points according to Naval Chart 35 to 40 m. (High water - 0839). Estimated explosive charge 400 kg. Heavy spray caused by detonation. Hardly any water columns.

1014

Both bower anchors and sternlines remain intact. According to the first damage reports (port engine out of action, flooding in generator room 2, lower platform deck - Section VIII and in after T.S.), the main defects are in Sections VII to IX near the detonation point aft. The ship gradually lists 1 degree to port. In the whole ship most of the lighting system and, as far as can be seen, nearly all electrical equipment, including the W/T and hydrophone offices are out of action. Two ship's aircraft outside the hangars out of action. Fly-off no longer possible.

1015

Second submarine surfaces on bearing 020 degrees about 300 m. off (outside the net enclosure) for some time and is fired at successfully by heavy and light A/A as well as by a nearby fjord boat. Hits definitely observed. One man climbs out, saves himself on a float anchored there and is brought on board by a picket boat. The submarine vanishes and is not again sighted. Destruction certain.

1030
to
1040

Patrol vessel "Z.27" drops 5 depth charges on bearing 000 degrees - 060 degrees, 300 to 500 m. off. Oil and wreckage appear at the place where the second submarine last submerged.

1032

According to prisoner's statement the first submarine has set two time bombs which, in the prisoners' opinion have already detonated.

1033

Report from L.O. : "About 500 cm. water in ship"

1035

According to prisoners' statement, three submarines took part.

1043

Third submarine on bearing 060 degrees to 070 degrees, 600 m. off, surfaced; was fired at by heavy and light A/A. Hits observed from several points. Probably sunk.

1045
to
1051

Destroyer on patrol drops 5 depth charges at place of sinking.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

- 1051 According to statement by prisoner from the second submarine, the craft has laid both mines outside the net enclosure. The setting time varies from 1/2 to 24 hours.
- 1100 Pumping out in middle and port turbine rooms is successful. Generator room 2 flooded with water and fuel oil. No.2 switchboard room. 50 cm. water and fuel oil.
- 1151 Rudder compartment 2 flooded, probably due to loss of watertightness in the rudder trunk.
- 1153 Hydrophone office again in order.
- 1145 Signal 1142/11 made by semaphore to "Erich Steinbrink":-
"Priority, addressed to Skl., Gruppe Nord/Flotte from Battle Group: 1012 heavy detonation 60 m. to port of TIRPITZ of time bombs of destroyed submarine. 500 cubic meters water in ship. 1035 second submarine sunk by gunfire 300 m. on the starboard bow. Commanding Officer taken prisoner. Third submarine, 600 m. on the starboard beam, fired at several times. Hits observed.
- 1215 W/T Room 'C' clear for transmitting and receiving.
- 1230 W/T doors closed as for cruising stations. Cruising watch closed up.
- 1240 Patrol vessel drops depth charges between A/A cruiser "Nympe" and Kaa Fjord boom.
- 1245 According to verbal preliminary report from Heads of Departments, the present state of the ship is as follows:-

1. Watertightness.
Approx. 800 cubic m. water in ship. Probable hits on port side in Section VIII. Flooding under control. Ship out of danger.
2. Engines.
All three main engines temporarily out of action. Port condenser damaged. One boiler flashed up.
3. Electrical Installations.
Generator room 2 flooded. Switchboard room out of action; 250 cm. of water in the compartment. Forward turbo-generator started up.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

4. Gunnery.

Turrets 'A' and 'C' raised by blast, so far out of action. A/A control positions out of action. Considerable breakdown of range-finding gear including revolving hoods, aft position and foretop

5. Communications Section.

Communication with W/T room 'C' established. Breakdown of several transmitters, receivers, radar sets and echo-ranging equipment.

6. Steering

Rudder compartment 2 flooded. Port rudder installation out of action, cannot be examined yet. Breakdowns in all sections (probably only temporary). Failure of electrical equipment due to shortage of power, fractures of casings and holding-down bolts.

1 killed, about 40 wounded, among them the First Lieutenant, slightly injured (concussion).

Battle Group verbally informed.

1325

At the place where the second submarine last submerged, a man with escape breathing apparatus appears, swims to a float and is picked up by fjord boat and brought on board. Patrol vessel again drops 2 depth charges at the place of sinking. Wreckage and thick oil come to the surface.

1348

Signal sent out 1217/m/C/52.
"Priority, Skl. Gruppe Nord/Flotte from Battle Group; Preliminary damage report; 1. Not 1, but 2 detonations forward and aft almost simultaneously.
2. Considerable impairment of fighting efficiency due to effect of mines.

1412

W/T Room 'B' again in order and manned.

1415

Draft of provisional gunnery action report.

1430

Draft of provisional report on engines, electrical installation and state of seaworthiness.

1432

Signal received 1407/84/53.
Emergency: S.O. 12th A/S Flotilla from Admiral Polarküste.
"Proceed with all despatch with 4 ships to Alta Fjord.
Report to F.O. (Cruisers) for urgent A/S duty."

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

- 1433 Signal received 1309/0/50.
Emergency: Battle Group, Admiral Nordmeer from Fliegerfeuhrer (Senior Air Force Officer)
Lofoten: "Operational intentions for 22.9 p.m.: Reference Battle Group signal 0931, 1 BV 138 searching with radar in a radius of 100 miles in 27 East 2153 for possible raft. Probable start 1315."
- 1515 Signal sent out:
"Provisional report to Battle Group concerning defects."
- 1520 Semaphore message to Boom Defence vessel and TIRPITZ. "First Boom Defence vessel to remain under way be boom gap. Second vessel proceed to act as control in area near TIRPITZ and be at her disposal".
Battle Group 2210.
- 1530 Additional W.T. doors and hatches closed.
The following remain closed up:-
Watch at A.A. stations.
Hydrophone watch.
Lookouts.
Reduced damage control and repair parties.
The state of readiness is reduced for the following reasons:-
(a) To facilitate speedily and uninterrupted action in dealing with defects and repairing damage; and to make personnel available for the placing of the collision mat and for clearing up.
(b) The closing of doors and hatches has rendered the ship safe below decks.
(c) A further submarine attack is not considered likely (all three probably destroyed); also a patrol vessel patrols outside the net enclosure for defence purposes and three picket vessels lie in readiness with depth charges.
- 1534 Signal received 1510/0/59.
Addressed to all ships from Battle Group:
"Submarine action Kaa Fjord top secret."
- 1550 Semaphore message to all destroyers, for information to TIRPITZ:"
"Anchor. 3 Hours notice. Ship's boats with depth charges at disposal of TIRPITZ."
Battle Group 2211.
- 1835 Signal sent out TIRPITZ G.3265 (short report) to Battle Group.
- 2100 Draft of final armament reports at 2000.
Gunnery and engine report. In the other sections no considerable breakdown apart from radar equipment, bow echo-ranging installation and two ship's aircraft.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

2200

Collective report sent out to Battle Group. Picket boats leave destroyers. Area between net enclosure and berth of "Nordmark" is protected by patrol vessel 5910 and Fjord boat, both armed with depth-charges.

A.A. watch, lookouts and hydrophone watch remain closed up under the orders of the P.C.O. of the watch. Searchlight 'O' in working order.

Finished 22nd September, 1943.

(Sgd.) Meyer

Captain and Commanding Officer.

11.3 In a report made at 2000 on 22nd September, 1943, the extent of the damage and progress of repair work is summed up in the following Appendix.

I. Gunnery.

Main armament

All turrets clear.

Secondary armament

Clear except for Port III which is jammed. It is estimated that the damage will be repaired.

L.A. Fire Control

including after T.S. in order.

Heavy A/A

Of the two control positions which are in order, 1 is unstabilised. The repair of the two damaged positions is being attempted.

Range-finding gear

Clear only in foretop, turret 'B', secondary armament turret. Repair of sets in turret 'D' and forward position is questionable.

II. Engines and electrical installations.

Repair considered possible, but final decision probable in one week after thorough examination.

Only 300 cubic m. of water remain in ship. Extent of leak not yet ascertained, but thought to consist of numerous cracks.

Generator Room II pumped out, remains defective.

Generator Room I, only 2 machines in order.

A.C. Supply from A.C. generator 4 J only till further orders.

Two power-ships alongside.

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

11.4 In commenting on the engine-room log of the TIRPITZ, the Battle Group authorities stated that this gave an incomplete impression of the course of events, and the following supplementary information was added regarding the damage:-

"Section (b)

During the first two hours after being hit, there was a scarcity of electric current. As the ship had a small auxiliary plant, the power supply was achieved by means of the diesel-generators. Generator room 2 flooded quickly and the crew had to leave. Generator-room 1 also flooded, but could be controlled. Bed-plate bolts and casings on all diesel generators were almost all cracked. For a time only diesel generator 1.1. was in operation. The other engines in generator room 1, however, were repaired except for generator 1.4. As a result of the breakdown in the mains circuit 1.3 (first it short-circuited, later the switch became faulty) and in switch-board room 2 (here the mains switches broke down owing to a slight penetration of water, which, being unable to escape through the drain valves on account of the 2 degree list, came in contact with the bus bars and caused a short circuit) the forward switch-board rooms 3 and 4 could not obtain any voltage. Consequently the bilge-pumps could only be put into operation by feeding them from switch-board rooms. Later, loose cables were laid from switch-board room 1 to switch-board room 3 via the shore connection switch".

"The bilge pumps had broken down at first partly through lack of electric current, partly through electrical and mechanical damage to the pumps or to their pipe-lines and switch gear (in particular the starter). Consequently the complete flooding of dynamo room 2 was unavoidable; it could, however, have been controlled if one bilge-pump had been in order. In middle and port turbine rooms water, partly mixed with fuel oil, rose above the lower deck plates. The electrical action repair party got some of the bilge pumps going and it was then possible to pump out the turbine and dynamo rooms and to keep them dry."

"On account of the breakdown of the whole electricity supply in the forward part of the ship, and the damage to the auxiliary blocks for burners in the after boiler rooms, no boiler could be lit for the time being. Eventually it was possible to supply boiler M1 with fuel from an improvised container, and thus to start up the turbo-generators."

11.5 According to an entry in the War Diary of the German Naval War Staff for September, 1943, it was decided on 25.9.43 that the repair of the TIRPITZ should be carried out in a Northern port. This decision received the sanction of the Fuehrer and the Commander-in-Chief of the German Navy. It was considered that the ship might never regain complete operational efficiency.

11.6 Interrogation of survivors and salvage of midget submarine

6.1 In the German report of the interrogation of survivors from the midget submarines, a list is included of the crews of the three craft which took part in the operation against the TIRPITZ.

6.2 It is stated that "X.5" (Lt. Henty-Creer, R.N.V.R.) was lost with her crew. The four members of the crew of "X.6" were rescued. In the case of "X.7", two members survived, the other two were posted missing. No further details are given regarding the missing personnel.

6.3 A signal from Battle Group to O.K.M. on 1st October, 1943, announced the salvaging and beaching of one midget submarine. This proved to be the "X.7" and a survey of the craft was commenced on the following day.

6.12 Details of the nets rigged around TIRPITZ in KAA FJORD
(Report N.I.D. 24/T.223/45)

12.1 In answer to a request from Director of Boom Defences for information as to the details of the nets rigged around TIRPITZ in KAA FJORD, the following report has been compiled from available captured German documents relevant to the subject, viz. "Schlachtschiff TIRPITZ: Sicherung ALTA FJORD, Netze - Baender 1, 2." Although the literature on the defence of ALTA FJORD is fairly extensive, it is thought that the best survey of the situation is to be found in the two sketches which form Appendix I and Appendix 2 in the report (D.N.C. Note. These appendices have not been reproduced here but the information given in them is shown in Figure 6.12). Unfortunately the last entry in the documents regarding defence measures for TIRPITZ was made on 3rd October, 1944. She was moved to TROMSØ on 16th October, 1944. Thus the actual state of her net protection at the time of sinking on 12th November, 1944, is not known.

12.2 From the summer of 1943 there was in KAA FJORD between AUSKARNESET and JEMMELUFTNESET an anti-submarine net, 48 metres deep, with a gap of 400 metres under JEMMELUFTNESET. This gap could be closed by a dummy boom consisting of a line of buoys on a connecting wire, the attached end of which was at JEMMELUFTNESET. A closing of this dummy boom was intended only in the event of a submarine alarm in the outer approaches of ALTA FJORD, as the traffic to ALTA-BOSSEKOP was fairly continuous and the dearth of tugs made a continual servicing of the boom-gate (Sperrriegel) impossible. Depth-charge throwers were stationed near JEMMELUFTNESET.

12.3 Round the TIRPITZ anchorage was a net enclosure, BARBRUDALEN, composed of a double aerial torpedo net and deep-protection, the former 15 metres deep, the latter up to 36 metres deep. The boom-gap of about 20 metres was situated at the front transverse crossbar, i.e. on the port bow of TIRPITZ. This boom-gap could be closed by means of a boom-gate only deep-protection, depth 11 to 36 metres.

12.4 In April, 1944, the "MONTE ROSA" enclosure at STRAUMSNESET was converted into a battleship enclosure for TIRPITZ. (See Appendix 1). The enclosure consisted of a double anti-torpedo net stretching 400 metres in a westerly direction with absolute deep-protection. The net-lengths were removed about 60 metres towards the middle of the fjord. At the landward end there is a 40-metre broad passage-gap for small vessels. The crossbar is constructed in such a way that the last frame-buoy (Rahmentonne) overlaps sufficiently. In addition, deep-protection nets are fixed under this crossbar, so that the whole net construction reaches to the sea floor. At the northern end of the net-lengths there is an 80 metre broad passage-gap for tankers and other larger vessels. This boom-gate opens towards the south-west.

12.5 The two 260 metre long double transverse nets with absolute deep-protection form a boom-gate for TIRPITZ. This gate is opened by unmooring it from the frame-buoy after which it is fastened to a D-buoy (D-Boje) to the landward side. Furthermore, for the protection of the battleship there is on the eastern side of the enclosure a double anti-torpedo net with deep-protection. This net fulfils a twofold purpose:- it prevents penetration into the enclosure by submarines and it catches any aerial depth charges dropped against the mountain. On the surface about 4 to 6 metres of the deep-net are visible. For protection against aerial depth-charges (rolling mines) the new berth of TIRPITZ was selected to provide a safety distance of about 120 metres. Because of the profile of the ground the possibility of the depth-charges rolling towards the ship is very small. The bottom net (Grundnetz) is strengthened by plate anchors fixed to land by wires to prevent further rolling of the mines. The whole south-easterly side of the net enclosure is constructed so that the bottom net should obstruct further rolling of the

SECTION 6 - X-CRAFT ATTACK AT KAA FJORD ON 22ND SEPTEMBER, 1943. (Contd.)

depth charges, the impetus of which is slowed up on entering the water. By means of depth-setting, the depth-charge - rolling down the incline - detonates about 100 metres from the ship. The only possibility of a nearer detonation occurs between the land defences to the south-eastern side of the net enclosure and the south-eastern mooring-post. Detonating aerial depth-charges may - between the stern and midships - tear open the net and thus roll towards the ship.

12.6 Work on the torpedo net closing-boom in KAA FJORD was carried out in May, 1944. A boom-gate of 200 metres was constructed with about 100 metres underwater and no other buoys. In June of the same year the boom-gate was enlarged to a length of 230 metres with a depth of 33 metres; the upper half was double, the bottom half single. A further boom-gate for KAA FJORD closing-boom was erected at the end of July. It was composed of double anti-torpedo nets (18 x 18 metres) and lengths of single torpedo netting joined together. Length of the gate was 144 metres with a stepped-up depth of 35 to 18 metres. In August a net (3 metres wide and 50 metres long) consisting of lengths of single torpedo netting was inserted as deep-protection in the small passage-gap, thus reducing the gap to a breadth of 8 metres and a depth of 10 metres. At the same time, because of recent damage of the "UNTERLIK" (translation unknown) the lower half of the boom-gate was attached to buoys independently from the upper half.

12.7 On 24th August, 1944, it was announced that the total length of the KAA FJORD closing-boom amounted to 1199 metres. It had a depth of 33 metres. By September it had increased to 1235 metres in length: of these 1235 metres, 850 metres stretched to the bottom, i.e. deep-protection was required for 385 metres only. On 12th September, 200 metres of deep-net (depth 47 metres) were laid, leaving 200 metres without deep-protection.

12.8 A report of 20th September, 1944, states that the western side of the STRAUMSNESET enclosure was seriously damaged by a British attack. As a result, a boom-gate of 252 metres had to be towed from KVAENIKSPERRE and fixed to the TIRPITZ enclosure. Repair work on the damaged enclosure was begun immediately.

6.13 Survey of Wreck. See Section 4.5 of Enclosure B. (Volume I).

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 ("OPERATION TUNGSTEN")

7.1: Extract from C. in C. Home Fleet's Message 051139B of April, 1944.

Following is preliminary assessment of damage to German Battleship ADMIRAL VON TIRPITZ and may be communicated to ships.

- 1.1 17 hits. 3 with 16 hundred pound bombs, 8 with S.A.P. bombs. 5 with M.C. and 1 with A/S Bombs.
- 1.2 Known that 1 - 16 hundred pound bomb hit rear superstructure. Other 16 hits were distributed throughout ship.
- 1.3 German Battleship ADMIRAL VON TIRPITZ was left shrouded in smoke with 2 fires burning amidships.

7.2 Extract from Interpretation Report S.A.1312 dated 10th April, 1944

Fleet Air Arm Attack on Battleship TIRPITZ in Kaa Fjord on 3rd April, 1944

2.1 Information received on the attack

- (i) Photographs (see Plates 7.2(a) to (d)) were taken by carrier-borne Barracuda aircraft during an attack on the Battleship TIRPITZ in KAA FJORD on 3.4.44.
- (ii) The aircraft attacked in two waves, the approach being overland. Photographs were taken on each occasion.

2.2 Summary of attack as seen on photographs

- (a) Photographs provide unmistakable evidence of the success and accuracy of the attack on the TIRPITZ. Two, possibly four heavy explosions took place during the first strike; in the vicinity of the control tower, abaft the main mast, on the starboard side of the control tower and in the region of the main-after turrets.
- (b) Photographs taken during the second strike show a high column of smoke emanating from the starboard side of the funnel, from what must have been a well established fire. Two other intense fires are also seen on the starboard side further aft.

2.3 The disposition of TIRPITZ

- (i) The Battleship is lying in the south western leg of the fjord in approximately the position she occupied on 13.3.44. She remains with bows pointing down the fjord but is, however, some 300 yds. from the head of the fjord, whereas on 13.3.44 her stern was moored close inshore. There are now no vessels alongside, although a small vessel is seen making away from her port side at considerable speed and another very small vessel lies obliquely against the starboard quarter. She appears to be almost clear on the boom as it existed on 16.3.44 and a small vessel, possibly a tug is visible at her bows. However, no actual movement is discernible on these photographs.

2.4 The attack as seen on photographs

(i) The First Strike

- (a) Photographs taken during the first strike show two and possibly four explosions on the ship; one in the vicinity of the control tower, one abaft the main mast and possibly one on the starboard side of the control tower and one further towards the stern. It is not possible

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

to determine either the exact point of impact of the bombs or their calibre.

- (b) A very dense mushroom-shaped cloud of smoke is seen to develop rapidly in the vicinity of the control tower and in later photographs to tower above the ship to a great height. This explosion is similar in general characteristics to those seen on air photographs when ammunition dumps have been detonated by aerial bombardment. Accompanying Print No. 1 (C.I.U. Neg. No. 37926). (D.N.C. Note - See Plate 7.2.(a))
 - (c) Whilst the smoke from the explosion described above is rising, the first indications of the second explosion are seen abaft the main mast. This again rises rapidly in a dense mushroom shape although of considerable volume but does not attain the height of the first explosion. Accompanying Print Nos. II and III (C.I.U. Neg. Nos. 37925 and 37923). (D.N.C. Note - See Plates 7.2(b) and 7.2(c)).
 - (d) As this second explosion is developing the control tower is seen to be silhouetted against an intense flash of light that may be due to a further heavy explosion abreast of the control tower on the starboard side of the ship. What is probably flying debris is seen silhouetted against the light and may support the suggestion that a further heavy explosion has taken place. Accompanying Print No. III (C.I.U. Neg. No. 37923). (D.N.C. Note - See Plate 7.2(c)).
 - (e) Further aft and more towards the starboard side in the region of X and Y turrets another column of smoke is seen rising. This has neither the density nor the height of the other explosions noted above.
 - (f) Whilst the second explosion is still concentrated and towering above the ship and the possible explosion on the starboard side of the control tower is taking place, two clear ripples are seen to have formed around the stern of the TIRPITZ. An instant later when the possible explosion in the region of X and Y turret is rising, the ripples are seen to have increased to four, closely spaced. This suggests that the overhang of the stern must have made a violent downward movement. Accompanying Print No. III (C.I.U. Neg. No. 37923). (D.N.C. Note - See Plate 7.2(c)).
 - (g) At the time when two ripples were visible at the stern two near misses are seen, one close to the port side opposite 'C' and 'D' turrets, the other on the starboard side further aft. High clouds of spray are being thrown up. By the time the fourth ripple is visible, only the disturbance in the water caused by these near misses is apparent. Several other near misses are visible on the port side, but these were further forward and at a greater distance from the ship. (Photo 1st Strike No.12 (Serial No.8)). (D.N.C. Note - Not reproduced here).
- (ii) The Second Strike
- (a) During this second phase of the attack, land detail in relation to the battleship is not clearly photographed and it cannot be stated with certainty that the TIRPITZ remains in the position she occupied during the first strike. The battleship itself is largely obscured by the smoke screen.
No direct hit can be confirmed but the following statements can be made.

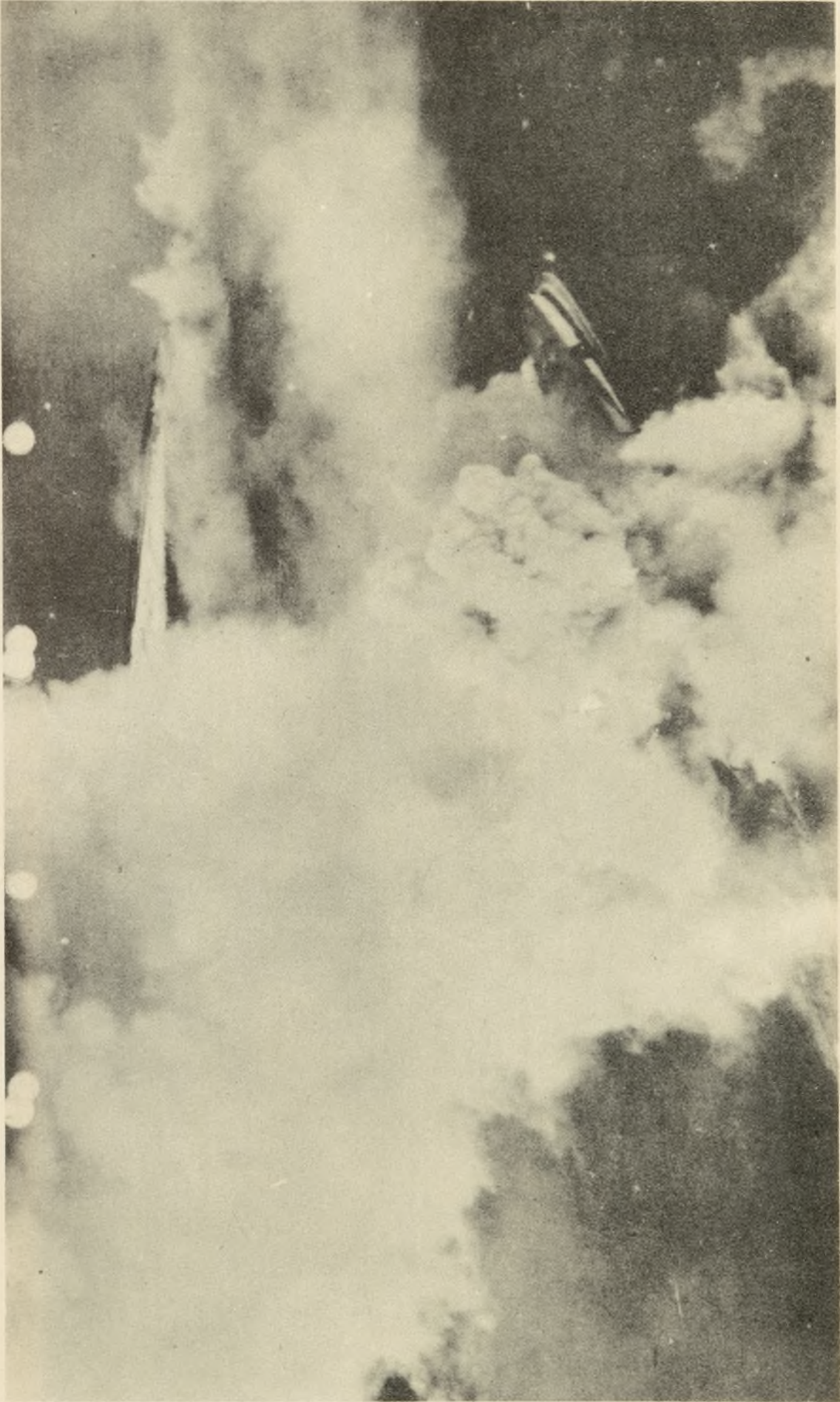


F.A.A. Attack on Tirpitz in KAA FJORD on 3/4/44

INTERPRETATION REPORT S.A. 1312



INTERPRETATION REPORT S.A. 1312 — F.A.A. Attack on Tirpitz in KAA FJORD on 3/4/44



INTERPRETATION REPORT S.A. 1312 — F.A.A. Attack on Tirpitz in KAA FJORD on 3/4/44



INTERPRETATION REPORT S.A. 1312 — F.A.A. Attack on Tirpitz in KAA FJORD on 3/4/44

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

- (b) A heavy column of smoke is emanating mainly from a point approximately at the starboard side of the funnel. This is seen as a tall column on all the photographs of the battleship during the second strike and is thus possibly a development of one of the explosions described during the first strike.
- (c) Two small but intense fires are burning in the vicinity of the starboard torpedo tubes or light armaments. Accompanying Print No. IV (C.I.U. Neg. No. 37924). (D.N.C. Note - See Plate 7.2(d)).
- (d) B turret is now swung 90 degrees Red. Although the roof of this turret appears to be blackened these photographs do not permit a statement on damage. The other three turrets of the main armament remain trained fore and aft. Accompanying Print No. IV (C.I.U. Neg. No. 37924).
- (e) A number of near misses are seen to port, starboard and off the starboard bow including a near miss from a probable heavy bomb very close on the starboard side amidships. Accompanying Print No. IV (C.I.U. Neg. No. 37924).

7.3. Preliminary examination of bomb damage - Information supplied to D.N.C. on 12th April, 1944, by Air Warfare and Flying Training Division.

3.1 A first examination of photographs and other available evidence shows that the following certain bomb hits were obtained on TIRPITZ by Barracuda aircraft on 3rd April:-

No.1 One 1,600 lb. A.P. bomb

Hit in area between 'A' and 'B' turrets and slightly to starboard of centre line. Direction of attack was from port quarter to starboard bow. Height of release 2,500 feet. There is evidence of a gash in ship's starboard side forward of 'A' turret.

No. 2 Two 500 lb. M.C. bombs (torpex filled)

Hit just forward and on port side of control tower. Direction of attack was along ship's length from stern to bow. Bombs released at 1,200 feet.

No.3 One 1,600 lb. A.P. bomb

Hit abreast main-mast on starboard side. Direction of attack not known. Height of release 3,500 feet.

No.4 One 500 lb. S.A.P. bomb

Hit starboard side in region of catapult. Direction of attack, from port quarter. Height of release 2,000 feet.

(Note:- The approximate positions of the above bomb hits are shown in Figure 7.5)

3.2 Fuzing of bombs was as follows:-

<u>Type of Bomb</u>	<u>Fuze or Pistol</u>	<u>Delay</u>
A.W/Mk.I 1,600 lb. A.P.	Mk.230 fuze	0.08 secs.
Mk.V 500 lb. S.A.P.	Pistol No.30	0.14 secs.
Mk.II 500 lb. M.C.	Pistol D.A. No.42 Mk.I	Instantaneous

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

3.3 With reference to hit No.2 above, distributor setting for M.C. bombs was 0.07 seconds interval with object of obtaining air bursts from 2nd and 3rd bombs in stick. This would give about 20 foot spacing on the ground.

3.4 Angle of dive employed varied between 45 degrees and 60 degrees, but may have been less than 45 degrees in a few cases. Height of release aimed at was 2,500 feet for 500 lb. bombs and 3,000 feet for 1,600 lb. bombs but it is thought that in general bombs were mostly released from 2,000 to 2,500, and lower in some cases.

3.5 D.N.C. is requested to assess the damage caused by the above hits, and to give an estimate of the time out of action, as soon as possible.

3.6 Further detailed examination of all available evidence is proceeding, and a more complete list of bomb hits for assessment will be forwarded in due course.

7.4. Preliminary assessment by D.N.C. of bomb damage. (Based upon the information given in Section 7.3)

4.1 From the evidence given in D.A.W.T's remarks (Section 7.3), the estimated damage in each case is as follows :-

No.1 One 1,600 lb. A.P. Bomb. Dropped from a height of 2,500 ft. (or even 3,500 ft.) this bomb would not have pierced the armour deck over the magazines.

If the bomb exploded on the armour deck, the compartment in which it burst would be completely wrecked and bulkheads from the side of A. barbette to after side of B. barbette damaged by blast and splinters. The main deck would be holed over an area of about 20 ft. diam. and distorted beyond this. The upper deck, which is the strength deck, would be also badly distorted and holed. The ship's side abreast the turrets is armoured up to the upper deck and it is unlikely that the ship's side would be holed in this region. If the gash in the ship's side forward of A. turret (mentioned in D.A.W.T's remarks) was caused by this bomb it would indicate that the bomb was deflected after entering the ship and that it exploded forward of A. turret. Alternatively, the bomb may have been deflected by hitting A. barbette armour and passed out through the ship's side before it detonated.

It is unlikely that this bomb caused any serious damage to A. or B. turrets or their supports.

No.2 Two 500 lb. M.C. Bombs. (fuzed instantaneous).

These bombs apparently burst on contact with the superstructure deck abaft B. turret and forward of the lower 15" control tower. The deck would probably be demolished within a radius of about 10 ft. of each hit and considerable blast damage would have been caused in the compartments immediately below. It is not known what these compartments contained, but it is unlikely to have been anything of vital importance.

Instruments in the lower 15" control tower were possibly damaged by blast.

It is unlikely that these two bombs seriously affected the fighting or seagoing efficiency of the ship.

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

No.3 One 1,600 lb. A.P. bomb

If dropped from a height of 3,500 ft., as stated in paragraph (a)1 of D.A.W.T's remarks, the bomb would probably have just pierced the armour deck, which is thinner in this region than it is over the main magazines.

If dropped from a height of 2,500 ft., as stated in paragraph (a)4 of D.A.W.T's remarks, the bomb would not have pierced the armour deck.

If the armour deck was pierced the bomb would have exploded in a secondary armament magazine or in one of the main engine rooms, probably the latter as there appears to be no evidence of a magazine explosion in this region. In this case one set of main machinery would have been put of action and the compartment immediately over severely damaged.

In the event of this bomb bursting above the armour the damage would be very similar to that described for hit No.1 above, with the additional probability that the after star-board 5.9" mounting was put out of action.

No.4 One 500 lb.S.A.P.Bomb. This bomb would reach but not pierce the armour deck. The light structure in the compartment in which the burst occurred would be wrecked. Main bulkheads probably intact except for splinter holes. The main deck over would be bulged up and holed. The upper deck (strength deck) would also be distorted and strained immediately above the explosion. The position of this hit as indicated on the enclosed print is close to the after boiler room uptakes so that it is possible that they may have been damaged by blast with possibly some blast damage in the boiler room.

It is very difficult, on the meagre information available, to give a reliable estimate of the time the ship is likely to be out of action as a result of the five hits mentioned in this paper. It would depend on the exact positions of the hits in relation to important equipment, details of which are not yet available. Also it is probable that fires would have occurred, the extent of which would depend on the amount of inflammable material present and the efficiency of the fire-fighting organisation.

It would appear that, except for the possibility of one set of machinery being out of action, little damage of a vital nature affecting seagoing or fighting efficiency was inflicted. If it were essential for the ship to put to sea, the necessary temporary repair of the damage caused by these five bombs could probably be made good in a minimum of about three weeks.

(sgd.) C.S. LILLICRAP.

DIRECTOR OF NAVAL CONSTRUCTION.

15th April, 1944.

7.5. Final examination of bomb damage - Information supplied to D.N.C. on 14th April, 1944, by Air Warfare and Flying Training Division, (A.W.D. 844/44)

5.1 The following is the final list of "certain" and "probable" hits on TIRPITZ by Naval aircraft as assessed at Admiralty from records (their approximate positions are shown in Figure 7.5). This list includes those already passed. (See Sections 7.3 and 7.4)

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944. (Cont'd)

Certain Hits

		<u>Height of Release</u>	<u>Direction of Attack</u>
No.1	1 - 1600 lb. A.P. between A and B turrets	2500 feet	Just abaft port beam
No.2	2 - 500 lb. M.C. forward of Control Tower	1200 feet	Stem to stern
No.3	1 - 1600 lb. A.P. abreast main-mast starboard side	3500 feet	Not known
No.4	1 - 500 lb. S.A.P. starboard side just abaft funnel	2000 feet	Just abaft port beam
No.5	1 - 600 lb. A/S? Hit abreast funnel port side	1500 feet	Stern to stem
No.6	1 - 500 lb. S.A.P.? Stard. after secondary gun turret	Not known	Not known
No.7	1 - 1600 lb. A.P. 'X' turret	Not known	Not known

Probable Hits

No.8	1 - 1600 lb. A.P. Abreast funnel port side	2500 feet	Port quarter
No.9	1 - 500 lb. S.A.P. Abreast funnel port side	2500 feet	From stard. <u>not</u> up and down ship
No.10	1 - 500 lb. S.A.P. Near foremost starboard secondary gun turret	Not known	Not known
No.11	1 - 1600 lb. A.P. Amidships	2000 feet	Not known
No.12	1 - 500 lb. S.A.P. 'X' turret	3000 feet	Not known

5.2 The accuracy of above heights of release cannot be guaranteed.

5.3 Reference hit No.5, the A/S bombs were hydrostatically fuze (fuze No.862 Mk.I) and it had been ascertained that they would detonate on impact in the event of a dry hit.

5.4 Request you will re-assess damage under following headings:-

- (i) taking "certain" hits only
- (ii) assuming all "probable" as "certain", i.e. assume all bombs in the list hit

(Sgd.) A.D. TORLESSE.

for DIRECTOR OF AIR WARFARE AND FLYING TRAINING.
14th April, 1944.

7.6. Final assessment by D.N.C. of bomb damage. (Based upon the information given in Section 7.5.)

6.1 The first four of the certain hits have already been considered in detail. (See Section 7.4).

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944. (Cont'd)

6.2 The additional damage done by hits 5, 6 and 7 is probably -

No.5 One 600 lb. A/S Bomb

This bomb would detonate on impact and cause local damage to light structure principally due to blast. Apart from possible incendiary effect it is unlikely that this bomb did any important damage.

No.6 One 500 lb. S.A.P. Bomb

This is stated to have hit the starboard after 5.9" twin mounting. If so, it would have penetrated the roof and demolished the mounting. If it just missed the mounting it would have penetrated the Upper deck and exploded on the Armour deck, which again would have put the 5.9" mounting out of action. The fire damage reported in the region was probably due to this hit, possibly from the ignition of charges.

No.7 One 1600 lb. A.P. Bomb on X turret

If this bomb hit the turret roof, which is of 6" armour, it would not have penetrated but would probably have burst above the Upper deck and damaged adjacent structure by blast and splinters. Possibly the after 15" control was damaged by splinters. If this bomb struck the Upper deck in the vicinity of 'C' turret it would have penetrated down to, but not through, the Armour deck. The damage in this case would have been very similar to Hit No.1.

6.3 It is unlikely in either case that 'C' turret was seriously damaged.

Blast and Splinter Damage from "Certain Hits"

6.4 The only possibility of damage below the Armour deck is from Hit No.3, and this only on the assumption that the bomb was dropped from 3500 feet. In this case probably one set of machinery would be out of action. The height of release was stated by D.A.W.T. to be uncertain and possibly not more than 2000 to 2500 feet (see 7.3) in which case the Armour deck would not have been pierced. Also the indications of damage in the vicinity of the main-mast suggest that this bomb exploded above the Armour deck.

6.5 Other damage affecting fighting efficiency is that the starboard after 5.9 inch mounting is out of action and possibly the lower forward and after 15 inch control position damaged.

6.6 Sea-going efficiency would be affected by damaged areas of strength deck, girders, etc., and also to other watertight structure. Large areas of accommodation spaces, etc., would be wrecked, including piping, ventilation trunking, non-essential cable leads, etc.

6.7 An important secondary effect of these hits would probably be to shake up the temporary repairs of the damage caused by X-Craft, particularly as it has been reported that large areas of watertight structure were temporarily repaired by cement.

Possible Fire Damage from "Certain Hits"

6.8 Four main areas of fire are indicated on Figure 7.5 the most important of which is probably that just forward of the bridge. It is not possible to assess accurately the damage caused by the fires, but it would appear likely

SECTION 7 - F.A.A. ATTACK AT KAA FJCRD ON 3RD APRIL, 1944 (Cont'd)

that the damage from this cause was considerable and would be more difficult to make good (even temporarily) than the direct damage caused by blast and splinters. The number of hits would have been sufficient to make fire-fighting difficult, as possibly fire services were seriously damaged.

6.9 Taking certain hits only, although temporary repairs sufficient to enable the ship to proceed to sea for an emergency operation could possibly be effected in a minimum of three months, completely effective repair would take considerably longer.

6.10 With regard to the probable hits, no penetration of the armour deck would be expected, but the effect of Nos. 8, 9 and 11 would be to augment considerably the damage from hits Nos. 4 and 5 in the general neighbourhood of the funnel. Considerable damage would be expected to funnel uptakes and very probably blast damage in the boiler rooms.

6.11 Hit No.10, if inboard of the foremost starboard 5.9 inch turret was in a position to inflict damage to important communications associated with the various control positions in and near the bridge. Associated with the damage to the lower forward 15 inch control position and the adjacent fire area its effect on fighting efficiency might well be serious.

6.12 The effect of Hit No.12 would be similar but less in extent than that of No.7. It may have caused fire in the neighbourhood of 'C' turret.

6.13 Taking both certain and probable hits into account, it is considered unlikely that the ship could take part in any form of offensive operation in less than 5 months.

(Sgd.) L.C. WILLIAMSON.

for D.N.C.

17th April, 1944.

7.7. Interrogation of Fregatten Kapitän (Ing.) Eichler

7.1 Eichler said that TIRPITZ was attacked on 3rd April, 1944, by about thirty Barracudas in two waves at approximately 0630 and 0730, carrying bombs, the largest of which he had estimated to have been about 700 Kgm. Complete surprise was achieved by the attack which commenced just as the ship was about to get underway to undergo extensive sea trials; the anchor was being lifted at the time.

7.2 Twelve hits and four near misses were registered but the attack had no appreciable effect on the main armament and no large fires were caused. In Eichler's opinion the midget submarine attack was considerably more effective. He was surprised at the low height from which the bombs were dropped, which he estimated as about 400 metres. (1320 feet approx.)

7.3 He said he remembered the following hits and near misses:-

- I. Bomb hit Upper deck on starboard side just before cable holders, lodged in the deck and failed to detonate.
- II. Bomb hit Upper deck on port side abreast 'B' turret and just abaft the after breakwater. It detonated on impact and although many splinter holes in the superstructure resulted, there were no holes through the Upper deck.
- III. Bomb hit roof of upper Conning Tower, failed to perforate the armour and detonated causing superficial damage and wounding members of the crew.

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

- IV. Bomb hit Upper deck abreast Bridge, detonated on impact causing a hole about 2 metres (6.6 feet) in diameter in the deck and some splinter damage.
- V. Bomb hit roof of S.II 15 cm. twin mounting, ricocheted off and skidded along Upper deck into the superstructure causing minor damage in its path and detonated just above the Upper deck. The resultant damage was confused by that due to No. VI.
- VI. Bomb hit Upper deck just abaft S.II 15 cm. twin mounting, rebounded and detonated above the deck, causing some superficial damage to superstructure.
- VII. Bomb hit funnel and detonated near it, causing considerable blast and splinter damage to the funnel and blowing a large cloud of soot over the amidship portion of the ship. Six of the twelve uptakes were compressed.
- VIII. Bomb hit Upper deck on the catapult on the port side, penetrated down to the Armour deck and glanced off the Armour deck, detonating in the space above it. It caused structural damage to the Battery deck and bulkheads above the Armour deck.
- IX. Bomb hit a boat on the Superstructure deck just before and to port of the main mast, passed through the boat and the aircraft Hangar and detonated in the Ward Room on the Upper deck, causing a hole about 2 ft. in diameter in the Superstructure deck but no hole in the Upper deck. The Ward Room was demolished and there was considerable damage to surrounding bulkheads and structure by blast and splinters.
- X. Bomb hit the water abreast S.III 15 cm. twin mounting, penetrated the ship's side below armour and detonated near the longitudinal protective bulkhead. The latter was bulged inwards about 15 cm. (6 inches approx.) and was strained but not ruptured. Minor bulkheads in the bulge were holed causing flooding in the adjacent bulge compartments and in compartments immediately inside the protective bulkhead adjacent to the burst.
- XI. Bomb hit Superstructure deck on starboard side of 'C' turret, passed through deck and detonated on the Upper deck causing a small hole in the Upper deck and destroying a large number of cabins in the vicinity.
- XII. Bomb hit the upper deck to starboard and just abaft 'D' turret, passed to the Armour deck and detonated on it causing extensive damage to structure above the armour deck.
- XIII - XVI. Four near misses along the starboard side caused dents and lengthwise tears in the hull which resulted in minor leaks.

7.4 Essential repairs took until the beginning of June, 1944, and by early July the ship was considered to be operationally fit.

7.8. Interrogation of Kapitan zur see Junge

8.1 This Officer, who was Second-in-Command of TIRPITZ at the time, said that she was bombed in Kaa Fjord on 3rd April by single-engined planes from carriers. The ship was about to get underway to undergo trials after completing repairs made necessary by the 'X' craft attack and that the attack

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

was a complete surprise. The planes were sighted when they were about 80 km. (50 miles) from TIRPITZ which gave her only a short time in which to prepare to repel the attack. The first wave commenced their attack at 0640 before the smoke and anti-aircraft gun defences were ready and watertight doors had been closed. The second wave attacked at about 0740. The height of release in both attacks varied from 100 to 400 metres (330 to 1320 feet approx.).

8.2 Direct hits were scored immediately after the commencement of the attack and shortly afterwards the Commanding Officer, who was standing near the conning tower at the time, was wounded by splinters from one of the bombs; Junge took over the command and went to the conning tower on the bridge. The ship was under way at the time, the fjord was filled with smoke and he feared his ship might run aground.

8.3 After the attack there were about 130 dead and over 300 wounded, many seriously. Communications were badly damaged and because of this it took a considerable time to assess the damage caused by the bombs. Junge took his ship back into her protective torpedo nets and had the wounded taken ashore. Repairs were started almost immediately, four weeks being required by the ship's staff to make the essential repairs, but complete repair of all the superficial damage took rather longer.

8.4 None of the bombs succeeded in passing through the armour deck although five holed it. There were small fires in the hangar and in living spaces. The large cloud of soot blown up by the bomb which hit the funnel may have given the impression of more serious fires. Detailed investigation revealed that the damage which had looked rather serious at first was only of a superficial nature. The casualties were due to small calibre gunfire from the supporting fighter aircraft and from bomb blast and splinters.

8.5 There were sixteen hits and near misses as follows:-

- I. Bomb hit upper deck on starboard side just forward of cable holders over junction of beam and girder and remained lodged in the deck. This bomb did not detonate.
- II. Bomb hit the upper deck abreast the port side of 'B' turret just before the after breakwater and detonated on impact causing some dishing of the upper deck and superficial damage to the superstructures.
- III. Bomb hit superstructure abreast conning tower and wounded C.O. and some members of the crew.
- IV. Bomb hit upper deck on port side abreast bridge and detonated while passing through the deck.
- V. Bomb hit S.II 15.cm. mounting and glanced off causing extensive superficial damage to superstructures.
- VI. Bomb hit edge of armour on upper deck abreast bridge and detonated. There was not much damage caused.
- VII. Bomb hit port side of upper deck on catapult, passed through this deck and the battery deck and detonated on the sloping armour deck which was bulged downwards but not holed. Some damage to structure above the armour deck resulted.
- VIII. Bomb hit edge of armour on starboard side of upper deck just before S.III 15 cm. mounting. Little damage was caused thereby.

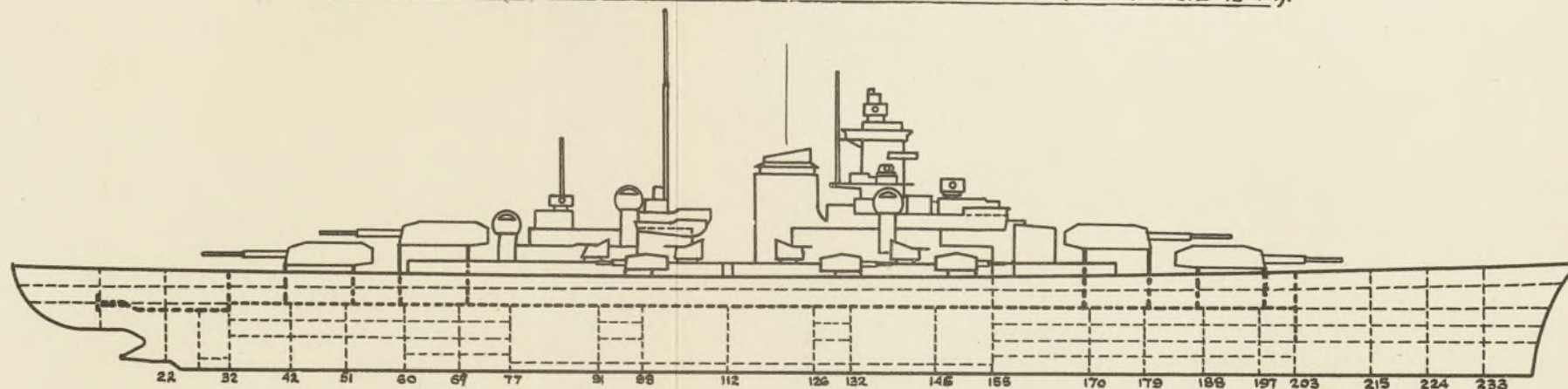
TIRPITZ.

PLATE 7.5

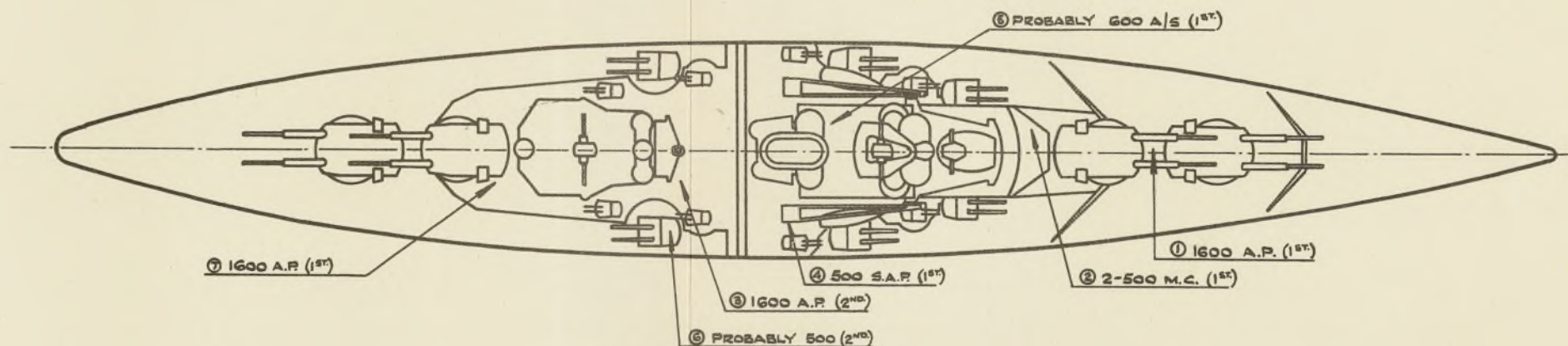
F.A.A. ATTACK - 3RD APRIL, 1944.

POSITIONS OF "CERTAIN" & "PROBABLE" BOMB HITS & EXTENT OF FIRE DAMAGE.

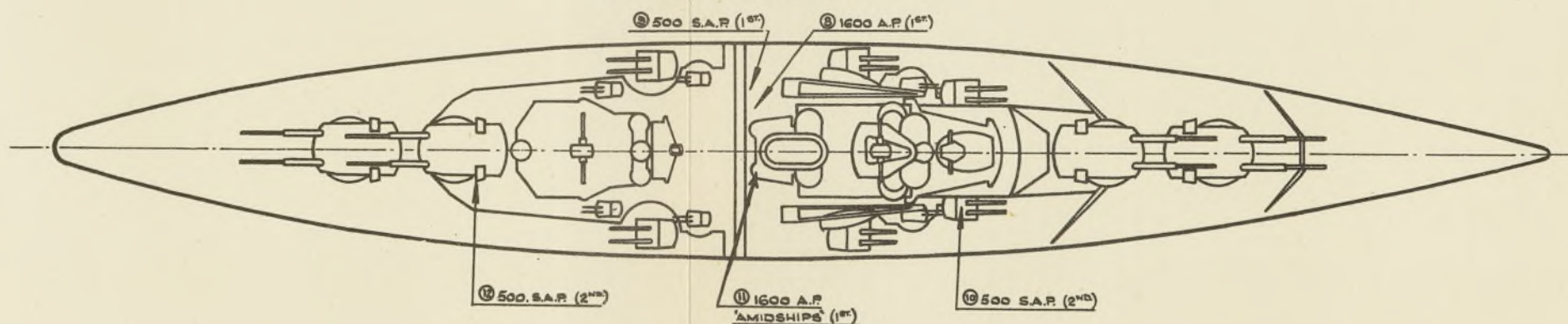
(BASED ON INFORMATION SUPPLIED BY A.W.D. ON 12TH & 14TH APRIL 1944).



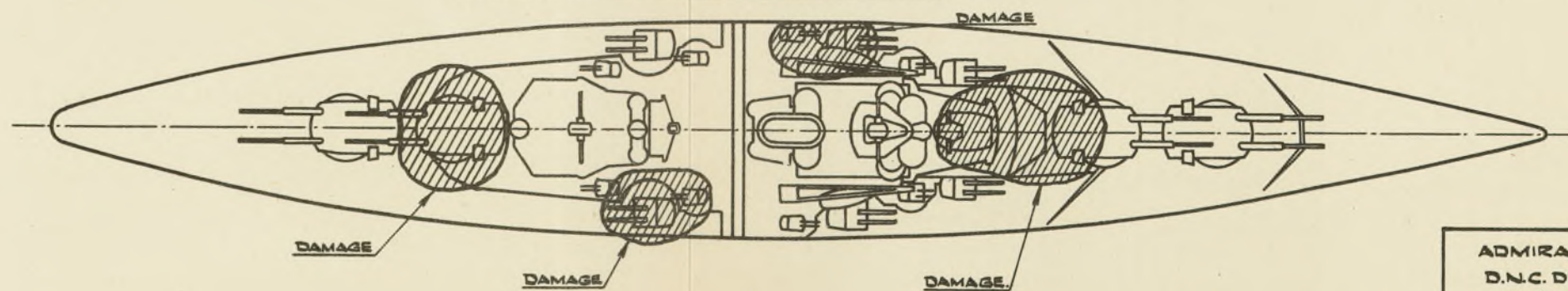
CERTAIN HITS.



PROBABLE HITS.



PHOTOGRAPHIC & CREWS' EVIDENCE OF FIRE. P.R.U. EVIDENCE OF SURFACE DAMAGE.



ADMIRALTY
D.N.C. DEPT.
N6/A67
N.H.
FEBRUARY 1948

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

- IX. Bomb hit water off starboard side of S.III 15 cm. mounting, penetrated the ship's side and detonated in the bulge. The longitudinal protective bulkhead was bulged inwards but not holed. Bulge compartments in Sections VIII, IX and X were flooded and some compartments inside the protective bulkhead and abreast the detonation leaked due to strained welds, etc. Repairs were very difficult to effect and the bomb therefore had considerable nuisance value.
- X. Bomb passed through superstructures into ward room and detonated on the upper deck. The ward room and adjoining cabins were destroyed and the upper deck bulkheads in the vicinity were bulged and holed by splinters.
- XI. Bomb hit superstructure deck just forward to starboard of 'C' turret. It ricocheted off the upper deck and detonated above it. The superstructure side and cabin accommodation on the upper deck in the vicinity were wrecked.
- XII. Bomb hit upper deck to starboard and slightly abaft 'D' turret, passed through to the armour deck and broke up on impact with the deck, causing a small fire.
- XIII - XVI. There were four near misses along the starboard side, one of which detonated close to the starboard shaft bracket and holed the side plating, causing some leakage.

7.9. Interrogation of Konter Admiral Peters

9.1 This attack was considered to be the most effective of all the F.A.A. attacks. TIRPITZ had one anchor up and was about to haul in the other and move off when the attack began. Complete surprise was achieved since the radar gear recently installed in the area was not yet fully operational.

9.2 The ship received sixteen direct hits; there was no damage from near misses. No bombs perforated the main armour deck but several bombs penetrated the upper deck and detonated between decks. No flooding was caused.

9.3 Ship was out of action for three months, becoming operational again on 1st July.

7.10. Captured German documents. (Extract from report N.I.D.24/T.67/45)

10.1 The following is a translation of the report of the attack made by the Captain of the TIRPITZ and details of the damage received by the ship.

(a) TRANSLATION OF CAPTAIN'S REPORT

10.2 High-speed trials and DG ranging of the battleship 'TIRPITZ' which were to have taken place on 1.4.1944 were postponed on 31.3 for 48 hours, owing to unfavourable weather forecast. On this day, the ship was lying at anchor inside the net barrage at Kaa Fjord, when at midday 2 enemy reconnaissance planes appeared over the ship, and as, owing to the existing state of the weather, it was presumed that they had had a good view of the Kaa Fjord, the Captain decided to move the ship at once to the net enclosure behind the torpedo net. Fortunately the state of the current allowed the move to be carried out immediately.

10.3 On 1.4 at 1031, a Spitfire again passed overhead. After a long interval reconnaissance planes had flown over the ship on two successive days, and it was presumed that the enemy had knowledge of the trial run of the TIRPITZ completed on 15/16.3., and was anxious to find out her future movements.

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

10.4 On 3.4 sea readiness was ordered for 0530 (slack water). The net enclosure manoeuvres started according to plan. The 3 stern cables were cast off and the port anchor weighed at 0635. While the starboard anchor was being weighed (3 shackles of cable still remaining out) it was observed that a smoke screen had been started from on shore. It was also reported by AWA (received at 0624 by the A/A post) that more than 32 aircraft were about 43 miles NW in Kaa Fjord proceeding on course South. The Captain consequently ordered the aircraft alarm to be sounded on board. At that time the starboard flak watch were at their stations and the main flak was manned. The ship was battened down for action.

ENEMY APPROACH

10.5 The first planes were sighted at about 0628 on the starboard quarter. The enemy formation divided for attack. About eleven single and twin-engined planes approached from the port quarter and about 15-18 planes of a similar type approached from the starboard quarter. Further aircraft approached from ahead. The planes to starboard divided again:- 3 planes, probably Martletts, increased speed and flew, mostly under cover of the mountains, towards the starboard bow at a distance of about 5,500 yards from the ship. The remaining planes remained on the starboard quarter until the planes ahead took up their position to attack. Then all the planes dived simultaneously towards the ship and opened fire with their guns. As the smoke screen was still very thin and only partially covered the vessel (Foretop completely uncovered) it was easy for the enemy to attack and interfere with the light flak defence, especially as the gun shields requested long ago were still not fitted.

10.6 At the sounding of the air raid warning, command was transferred to the forward control position. At the time the ship was attacked by gunfire i.e. about 0630, the starboard cable had been shortened in to just over 1 shackle, and the ship was under way and on her course for leaving harbour. Owing to the short notice the "Crash" closing up of watertight doors had only been 80% completed. The A.A. armament was ready to open fire.

FIRST ATTACK

10.7 The formation on the starboard side was quickly sighted by the forward starboard A/A spotter and fire control position reported the target in sight, range 18,300 yards on a bearing of about 160 degrees. The starboard heavy flak battery opened fire on a bearing of 160 degrees, range 17,340 yards. The 3 aircraft flying in on the starboard bow were engaged by the forward starboard light flak because of the large number of aircraft flying in. The aircraft flying in to port (about 20 in number) flew along the ridge of the mountains, making use of every dip, and so low parallel to the ship that they themselves could only see the foretop, thus making it impossible for the lower lying guns and controls to fire at them. When these aircraft were in a position between 220 degrees and 240 degrees from the ship, they suddenly (from a distance of 2,200 yards), "hedge-hopped" over the mountains and dived on to the ship, firing with all their guns. The bombs were released from a height of 600-1,000 ft. At this time the main flak battery with both forward flak fire controls had already been put out of action by gunfire just after the order "Independent Fire" had been given to the officers of quarters of the batteries. This order was necessary as the number of enemy planes and their division into separate formations made it impossible to allot the defence to individual Flak groups. Moreover the thickening smoke made the defence increasingly difficult.

10.8 At 0631 the ship sustained the first hit. The results of this and the 14 other hits are given in detail in Appendix I. Details of hits and the effects of these could not be obtained during the attack as communications had partially broken down and some of the crew were still engaged in closing watertight doors and was not yet at their action stations. Information of losses and

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

casualties among guns and guns crews was also lacking. Telephone installations had been largely destroyed, order transmitter was out of action. At 0645 the enemy action ceased. The attackers flew off ahead of the ship, flying low and machine-gunning any craft lying in the vicinity.

10.9 A W/T signal could not be sent out till 0752 as all aerials were damaged. At the end of the attack the position was as follows:-

1. Ship's control installations in order except for engine room telegraph and helm indicator.
2. Slight list to starboard owing to flooding tanks having filled with water.
3. Ship lying across the Kaa Fjord, bows to the West close in land. Heavily smoke-screened.
4. Tug out of sight.

As it was doubtful if the trials could now be carried out, and as further attacks had to be expected, it was decided to return to the net enclosure. Manoeuvring into the net enclosure was commenced without the Tug.

SECOND ATTACK

10.10 At 0733 a W/T signal was received from shore of a new enemy aircraft approach. Regarding the second attack, no information can be given as to tactics of the number of planes employed, as the main flak batteries were given up as a total loss and the flak defence was transferred to the flak batteries aft. Noise detection was badly hampered by a howling siren which could not be turned off immediately. In spite of this, dive bombers were definitely detected in this attack. All guns were firing blind through the smoke. The heavy flak batteries fired barrage in their nearest sectors.

10.11 Six further hits were sustained, including one unexploded. Details are given in the appendix. Results of investigation point to 500 lb. H.E. and armour-piercing bombs being used. Armour up to thickness of 50 mm. was holed.

10.12 After this attack which again only lasted a few minutes, the entrance manoeuvre was continued. At 0819 the manoeuvre was broken off on receipt of a signal reporting the new approach of 4 planes and the ship turned again so as to lie broadside to the anticipated course of approach. No planes were observed and no enemy action was detected.

10.13 At 0825 a signal was received from the minefield patrol reporting a torpedo track observed from 1 to 9. The meaning of "1 to 9" is in this case obscure and it is not clear what reporting system is being used. The German text is as follows: "0825 Uhr geht eine Meldung des Speerbewachers über gesichtete Torpedolaufbahn von 1 nach 9 ein". As danger from torpedoes seemed momentarily more menacing the interrupted entrance manoeuvre was continued as the ship would be in a more favourable position for torpedo defence. The ship entered the net enclosure at first under own steam, later (owing to conditions of visibility) with the help of tugs. At 0847, smoke from shore was stopped. The enemy attacks were over.

10.14 Ammunition expended

- 10.5 cm. - 506 HE rounds
- 3.7 cm. - 400 HE rounds
- 2 cm. - 8,260 HE rounds

SECTION 7 - F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

10.15 Casualties.

122 dead, including 8 officers and officials, 22 petty officers, 90 ratings and 2 dockyard employees.

316 wounded, including 18 officers, 31 petty officers, 266 ratings and 1 dockyard employee.

(b) TRANSLATION OF DAMAGE REPORT

10.16 In the air attack on 3.4.1944, the following hits were obtained by the attacking formations:- 13 hits above deck, 1 underwater and one near miss. In the diagram attached to the action report (not reproduced here), the hits are numbered in order from forward to aft. It is impossible to estimate the times of the hits accurately as there is no proof of these times. It can only be stated that hits nos. 3, 5, 7, 9, 10-15 were scored by the first wave of aircraft, and hits nos. 1, 2, 4, 6, 8, were scored by the second wave.

1. HIT No.1

An armour-piercing bomb hit the foredeck in compartment XVI, broke through the upper deck and was stopped by the deck transverse frame. The bomb did not explode and was rendered safe, cut out of the deck, and removed.

2. HIT No.2

A high explosive bomb hit compartment XVI and exploded against the breakwater and caved the deck in slightly. The deck planking was pierced and torn away all round. No damage was inflicted on the upper deck, splinter effect on all sides, but otherwise no damage.

3. HIT No.3

An H.E. bomb hit the deck of the forward night control position to starboard, at the forward corner of the bridge. The deck was perforated inward and forced aside and the deck of the bridge steering position was perforated inward to an extent of 1 square metre (1.2 square yards). There was heavy splinter effect and splinters were embedded in the control tower. Slight damage and casualties were suffered by the machine-gun crews.

4. HIT No.4

An H.E. bomb hit the portside upper deck in compartment XIII. The upper deck was perforated inward forming a hole with 5 flaps and about 110 inches in diameter (80 cm). There was also strong blast and splinter effect on the pedestal mounting of Port 1 10.5 cm twin flak gun, and the gun platform was bent upwards. The splinter effect worked downwards to compartment XIII and there was damage by fire.

DAMAGE:- 10.5 cm twin flak out of action.
Heavy damage by fire in the living quarters.

5. HIT No.5

An armour piercing bomb holed the picket boat in the crutches, and the turret cover of the starboard 2.15 cm gun (trained at 45 degrees) and without detonating passed through the gun platform, coming out near the barrette, and was deflected 90 degrees inward by the upper deck from whence it passed through the side of the gun-room where it detonated.

DAMAGE:- Picket boat fell on to the turret and is unuseable.
(The turret remained clear for action)
Severe splinter and incendiary damage in the gun-room, adjoining compartments and flats.

6. HIT No.6

An H.E. bomb hit the outer edge of the scuppers in compartment XII and exploded.

SECTION 7 F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

DAMAGE:- Degaussing apparatus was holed and damaged.
Heavy splinter effect, but no other damage.

7. HIT No.7

An H.E. bomb hit the funnel and A/C hangar (on the port side). It pushed the wall of the funnel outwards and collapsed the roof of the hangar.

DAMAGE:- Outside wall of funnel damaged.
Port funnel crushed, also hangar and aircraft.
Funnel quadruple gun tilts from pivot and searchlight
No.2 fell from aloft.
Slight damage from fire.
Splinter casualties among the crew.

8 HIT No.8

An H.E. bomb holed the after edge of the hangar and the superstructure deck and exploded in the compartment below. The sides of the compartments and the flat were blown outwards. Heavy splinter and damage by fire.

9. HIT No.9

An armour-piercing bomb hit compartment X on the superstructure deck and holed the upper and main decks just outside the splinter bulkhead and exploded at the start of the armoured belt. The torpedo bulkhead was torn from its overlapped rivetting (Laschnietung) and rolled up inwards for a length of 4.3 to 9.8 feet. The living quarters in compartments X & XI on the main and 'tween decks were completely destroyed. The main deck was torn off at the splinter bulkhead and bent against the upper deck. The inner port side of the main deck was arched steeply upwards. The adjoining workshops and store-rooms were damaged. There was also heavy damage by fire.

With this hit, which was undoubtedly caused by an armour-piercing bomb, other circumstances may have co-operated in the heavy damage of the torpedo bulkhead. The pipe-line for fuelling the aircraft passed through this compartment and it was suspected that petrol vapour exploded and thus increased the effect of the detonation.

In comparison with the detonation effect of the armour-piercing bombs which hit the ship, it seems improbable that the damage done to the heavy torpedo bulkhead could have been caused by the explosive filling of the armour-piercing bomb alone.

10. HIT No.10

An H.E. bomb hit the starboard side in compartment X at the joint of the side armour. Splinter effect outward, but no damage.

11. HIT No.11

An armour-piercing bomb penetrated the picket boat, the side of the after A/C hanger, the superstructure deck and exploded in the wardroom. The adjoining cabins were completely destroyed by splinter effect and fire. The upper deck armour plate was bent inward.

12. HIT No.12

An armour-piercing bomb entered the water close to the ship's starboard side and exploded at a distance of about 3 yards, causing concussion in the ship. The outer skin was stripped open to a length of 2.2

SECTION 7 F.A.A. ATTACK AT KAA FJORD ON 3RD APRIL, 1944 (Cont'd)

yards and a width of 1.1 yards. The adjoining flooding tanks filled with water.

13. HIT No.13

This was an underwater hit by a delayed action armour-piercing or H.E. bomb which exploded in compartment IX between the underside of the side armour and the bilge keel and tore a hole 3 x 1.5 ft. The starboard flooding tanks IX and XI filled with water, probably as a result of Hit No.12. In addition to this, the torpedo bulkhead was bent inwards to a length of 16 ft. and the transverse bulkhead was folded inside the torpedo bulkhead. The flange rivetting became leaky. It was necessary to postpone further investigation until it was possible to enter the compartments.

14. HIT No.14

An armour-piercing bomb perforated the superstructure deck in compartment VII to starboard, holed the upper deck to the size of its own circumference but did not perforate it however, and was thrown back and finally exploded about 3 feet above the point of impact in the upper deck. Damage was inflicted in all directions to the cabins and the superstructure deck. There was also strong splinter effect, and splinters penetrated the upper deck from above.

15. HIT No.15

An armour-piercing bomb penetrated the upper deck on the starboard side of compartment III, the main deck below and the 'tween deck, hit the armoured belt, was deflected upwards and parts were forced back again through the 'tween deck. There was no detonation, probably only a partial explosion and the remainder of the charge burnt away, resulting in heavy fire and a thick smoke effect. The nose of the bomb was found undamaged (about half the size of the whole bomb) and several pieces weighing 44-66 lbs were found heavily blackened with soot. The base of the bomb broke on the armoured slope before the fuze ignited and this caused the partial explosion of the charge.

10.17 Apart from these bomb hits damage was caused by gunfire, principally to guns, gun-mountings and range-finders. A few holes were found from H.E. shells of 2 cm calibre, but principally holes from armour-piercing H.E. shells of 12.8 mm calibre. There were shells with armoured core (Panzerkern) of 10.8 mm with copper case (Kupferhemd) flanged underneath. Splinterproof shields were not holed but only plate shields.

7.11. Survey of wreck

See 4.4 of Appendix B. (Volume 1)

SECTION 8 - F.A.A. ATTACK AT KAA FJORD ON 17TH JULY, 1944

8.1. Information supplied to D.N.C. by Air Warfare and Flying Training Division

TIRPITZ was attacked with 1600 lb. A.P. bombs fused .08 sec. delay and with 500 lb. bombs. No claims were made by the air crews engaged on the operation.

8.2. Captured German Document. (Extract from report N.I.D.24/T.67/45)

2.1 On 17.7.1944, the TIRPITZ was lying in Kaa Fjord. As a reconnaissance plane had been observed on 12.7 at 1811 (Mosquito) and again on 14.7 at 1400 (PE 2) a large scale air attack was anticipated and the anti-aircraft watch was increased.

Weather conditions at the time of attack were as follows:-

Wind SW 1-2 (Strength 2-3 metres/sec.) cloudy. Ceiling 2000-3000 m.
Visibility good.

2.2 Time-table of operation

- 0204 Signal received from Alta:- 60 aircraft observed at 0200, 43 miles, NW course. NE. Subsequent signal 90 aircraft at 43 or 38 miles in NNW course E.
- 0208 Both Flak watches at action stations. Ammunition hoist started.
- 0209-0210 Further signals from Alta in confirmation.
- 0213 Smoke-screen started at stern and smoke candles on upper deck lit.
- 0214 Smoke-screen from shore reached the stern of ship.
- 0215 Order to engine-room: Make smoke as soon as ready.
- 0217 Water-tight doors closed.
- 0219 Opened fire (Barrage and/or Target).
- 0220 Approach from starboard fore and aft. Ship well-covered by smoke-screen, with the exception of the superstructure on the starboard side and the mastheads.
- 0221 KR signal sent: Air attack on the TIRPITZ. At the same time a violent vibration was felt in the control position. Shortly afterwards a message was received from the Engineer Officer:- Damage control leader IV reports heavy vibrations in the immediate vicinity. (On investigation, no damage was found, evidently it had been a harmless near-miss).
- 0225 Aircraft passed overhead. (No further observations, as, apart from an occasional slight clearing, the ship was effectively wrapped in thick smoke until the end of the attack).
- 0230 Black smoke from funnel.
- 0240 Message to 1st Flak Officer:- Flak must on no account run out of ammunition.
- 0244 Signal from Flak Group Command:- New approach of 10 monoplanes from NW.

SECTION 8 - F.A.A. ATTACK AT KAA FJORD ON 17TH JULY, 1944 (Contd.)

- 0247 KR signal sent:- Attack continuing, so far no hits.
- 0250 Signal from Main Aerial Observation Post at Alta:- Nothing further to report.
- 0252 Ceased Firing.
Ship undamaged except for a barrel premature in right gun of starboard IV, 10.5 cm. One man was slightly injured. Observation from the deck showed 4 near misses on the starboard side and 3 on the port side of the ship. 5 men in the forward 15 cm. turrets suffering from smoke and gas poisoning.
- 0314 W/T Signal sent:- Attack from the first wave ended with no hits. The exact number of aircraft was not observed clearly. Further reports to follow through Battle Group.
- 0425 KR signal received from Patrol Boat NH 01:- 0230 40 aircraft, English twin-engined carrier planes flown off on course W. Attack by ten planes, 2 observed to be shot down. No damage.
- 0541 From FDK:- Air Raid Alarm ended. Increased Readiness.

2.3 Conclusion

The failure of the attack was due to the fact that the TIRPITZ had 15 minutes warning which gave her sufficient time to man her guns, clear the ship for action, and put the various smoke screen apparatus into action. The weather conditions were particularly suitable for the use of smoke screen. The concentrated barrage from guns of all calibres screened the ship with such success as to ward off the attacker, whose task was made more difficult by this smoke screen.

2.4 Ammunition expended by the TIRPITZ during the attack, which lasted 33 minutes:

Main Armament	39 rounds
Medium "	359 "
Heavy Flak	1973 "
Light " (3.7 cm.)	3967 "
" " (2.0 cm.)	28550 "

SECTION 9 - F.A.A. ATTACK AT KAA FJORD ON 22ND AUGUST, 1944.

9.1. Information supplied to D.N.C. by Air Warfare and Flying Training Division

1.1 There were two attacks on 22nd August, 1944, against TIRPITZ. In the first attack ten 500 lb. S.A.P. bombs fused .14 sec. delay were dropped, a hit (on 'B' turret) and a probable hit were claimed. In the second attack six bombs similar to those used in the first attack were dropped; two hits (one on the starboard side between the Bridge and after superstructure and one about 20 feet from the stern) and also two near misses, were claimed.

9.2. Captured German Documents (extract from report N.I.D.24/T.67/45)

Two attacks were made by the F.A.A. on the TIRPITZ in Kaa Fjord on 22.8.1944.

2.1 First Attack

1.1 1249-1312, a low-flying attack was carried out on the TIRPITZ, destroyer Z.34, NEUMARK and NORDMARK, by Spitfires, Martletts and Barracudas. The principal approach was from the N.E. but later also from the S.E., height of attack 1300 feet. No damage was done to the TIRPITZ but 20 men suffered from smoke-gas poisoning from the main armament. Two aircraft from the ship were sunk in the seaplane harbour at Bukta by gunfire. All TIRPITZ' guns were in action in target and barrage fire. A smoke screen (which was at first insufficient but later complete) was laid in the whole of Kaa Fjord. There were several near misses round the battleship, and several aircraft were observed shot down.

1.2 Ammunition expended

38 cm.	62 rounds
15 cm.	363 rounds
10.5 cm.	20%
3.7 cm.	5%
2.0 cm.	17%

2.2 Second Attack

2.1 1916 to 1927, an attack was conducted on the TIRPITZ, Z.34, NEUMARK and NORDMARK by about 20 carrier borne planes, in two waves. No units were damaged. Guns were fired throughout the action and a smoke screen was laid as in the first attack. There were several near misses with bombs and four aircraft were shot down.

2.2 Ammunition expended

38 cm.	13 rounds
15 cm.	124 rounds
10.5 cm.	750 rounds
3.7 cm.	1538 rounds
2 cm.	15800 rounds

2.3 Summary of both attacks

First Attack:- 1249 to 1312 attack in Kaa Fjord by about 50 carrier planes, from NE and SE types Spitfire, Martlett and Barracuda.

Second Attack:- 1916 to 1927 by about 20 carrier planes. Two waves, S to SE.

SECTION 9 - F.A.A. ATTACK AT KAA FJORD ON 22ND AUGUST, 1944. (Contd.)

No damage to Units except for JEVERLAND which received 50 hits from gunfire.

Total casualties:- 1 dead, 10 wounded.

All guns on the TIRPITZ were in action, and the total ammunition used during both the attacks was about the same as on 17.7.1944. The TIRPITZ observed 12 enemy planes shot down, 8 during the first attack and 4 during the second attack.

SECTION 10 - F.A.A. ATTACK AT KAA FJORD ON 24TH AUGUST, 1944.

10.1. Information supplied to D.N.C. by Air Warfare and Flying Training Division

Level bombing was carried out from a height of 4,500 feet and dive bombing from 1,000 feet. The following were dropped:-

1600 lb. A.P. bombs fused .08 secs. delay - 18 in No.
1000 " " " " " " " " - 5 in No.
500 " S.A.P. " " .14 " " " " - 10 in No.

One hit on the bridge superstructure with a 500 lb. S.A.P. bomb was claimed. One probable and one possible hit with 500 lb. S.A.P. bombs were also claimed.

10.2. Interrogation of Fregatten Kapitän (Ing.) EICHLER

This attack was the heaviest made by Fleet Air Arm planes but the very good anti-aircraft barrage put up prevented it from being pressed home. One bomb hit the ship - a 1600 lb. A.P. - and penetrated down through the armour deck and came to rest in the vitals of the ship underneath the bridge at about station 159. The fuze failed to function and the bomb did not detonate.

10.3. Interrogation of Kapitän zur see JUNGE

The attack was made with Barracudas from Home Fleet carriers flying from 500 to 800 metres (1650 to 2640 feet). The noon attack was the heaviest made from carriers. TIRPITZ received two direct hits, there were no near misses. One direct hit detonated on the top of 'B' turret and dished the turret roof plating downwards a maximum of 200 mm. (8 inches approx.) and destroyed an anti-aircraft gun mounted on the turret. The other hit occurred in Section XV of the ship and penetrated the upper deck and armour deck but did not explode. The bomb weighed about 1500 lbs. After extracting the fuze it was found to contain rather more than 100 lbs. of explosive.

The second attack made in the evening with six planes did not achieve any hits.

10.4. Interrogation of Konter-Admiral PETERS

A smoke-screen was put up but ship suffered from two direct hits. One 1600 lb. A.P. bomb perforated the armour deck but failed to detonate. This bomb was recovered resting on the inner bottom (lower platform deck) and was harmlessly jettisoned. A second bomb detonated on the roof of 'B' turret causing the top plates to be dented. (Note by D.N.C. - This was probably a 500 lb. S.A.P.)

10.5. Captured German Documents (Extract from report N.I.D.24/T.67/45)

5.1 Time-table of aircraft attack

1541 Signal received from Alta:- Large number of planes reported about 63 miles WNW flying low on course S.

1547 Aircraft Alarm. Effect of smoke screen moderate, insufficient forward and to starboard. Aircraft approaching from all directions, mostly from 6,500 to 10,000 feet, diving to 650 to 1,000 feet. There were about 80 planes in all, mainly Barracudas, but Martletts and Corsairs also were recognised.

SECTION 10 - F.A.A. ATTACK AT KAA FJCRD ON 24TH AUGUST, 1944. (Contd.)

1600 to 1633. Target and barrage fire was opened with three short intervals. Two direct hits were received; an H.E. bomb exploded on 'B' turret and destroyed the quadruple gun. The turret roof was dented but not penetrated, and the range-finder was put out of action. One unexploded armour-piercing bomb penetrated the main deck (armour deck) and passed through the portside of W/T office B (Section XVI) and finally lodged in No.4 Switchboard room, damaging the main switchboard. There were several near misses in the net enclosure. 6 to 8 planes were observed shot down.

5.2 Casualties and damage

Eight dead including one dockyard employee. Three men severely wounded, ten slightly wounded and five suffering from smoke gas poisoning.

Elevating gear of right gun in 'B' turret was put out of action, but was repairable on board, 2 cm. quadruple gun on 'B' turret completely destroyed, 3-2 cm. barrel prematures, slight breakdown in ammunition hoists (Flak). Port 15 cm. turret out of action temporarily, prior to clearance of unexploded bomb.

Ship's last effective Arado aircraft severely damaged by gunfire in Alta seaplane harbour.

5.3 Ammunition expended

Main Armament	72 rounds	
Medium Armament	510 rounds	
Heavy Flak	30%)	of the already considerably reduced normal stock.
Light Flak 3.7	20%)	
Light Flak 2 cm.	40%)	

5.4 Conclusion

"The attack on 24.8.1944 was undoubtedly the heaviest and most determined so far experienced. The English showed great skill and dexterity in flying. For the first time they dived with heavy bombs. During the dive-bombing, fighter planes attacked the land batteries which, in comparison with earlier attacks, suffered heavy losses. The fact that the armour-piercing bomb of more than 1540 lbs. did not explode must be considered an exceptional stroke of luck, as effects of that explosion would have been immeasurable. Even incomplete smoke-screening upsets the correctness of the enemy's aim, and it has been decided from now on to use smoke in wind strengths up to 9 metres/sec., irrespective of possible gaps." It has also been ordered that the time of notice for smoke (at present 10 minutes) is to be reduced to 7 minutes.

SECTION 11 - F.A.A. ATTACK AT KAA FJORD ON 29TH. AUGUST, 1944.

11.1 Information supplied to D.N.C. by Air arfare and Flying Training Division.

TIRPITZ was attacked with the following:-

1600 lb. A.P. bombs fused .08 sec. delay	-	26 in No.
1000 " " " " " " " "	-	2 in No.
500 lb. M.C. " " instantaneous	-	3 in No.

Two possible hits were claimed, one with a 1600 lb. bomb and one with a 1000 lb. bomb.

11.2. Captured German Documents. (Extract from report N.I.D.24/T.67/45)

2.1 On 29.8.1944, the TIRPITZ was attacked between 1702 and 1725 according to ship's daily log, (1727 according to action reports) in Kaa Fjord by 50-60 British carrier-borne aircraft, types Corsair, Martlett, Spitfire and Barracuda.

2.2 The TIRPITZ had been receiving warnings during the day from the main aerial observation post at Alta of possible air attacks, and at 1645 Alta reported 9 planes at high altitude 54 nautical miles WNW. The air raid warning was immediatly sounded on the TIRPITZ.

2.3 A lookout post had also been installed on a high mountain on shore, under the direction of an officer from the TIRPITZ, and this officer communicated with the ship on VH/F, informing her of the positions of the aircraft and the directions from which they were flying in.

2.4 The British aircraft flew in from the West in four waves, and attacked the TIRPITZ from the North, West and South. About 20 Barracudas dive-bombed, while other aircraft conducted low-flying attacks. No bombs hit the TIRPITZ, although some fell very near causing six men to be wounded by splinters and burns. The No.2 port side ammunition hoist of the 10.5 cm. (4.1 inch) gun was damaged and there were two light flak barrel prematures.

2.5 The TIRPITZ opened up target and barrage fire on the aircraft, and the main and secondary armaments were trained in the directions from which the aircraft were expected to fly in. Shore batteries also opened fire.

2.6 The following ammunition was used:-

Main armament, 38 cm. H.E.	54 rounds
Secondary armament, 15 cm. H.E.	161 rounds
Heavy flak, 10.5 cm.	22%
Medium flak, 3.7 cm.	9%
Light flak, 2 cm.	18%

2.7 The British aircraft were observed to lay mines in Stjernsund and Alta Fjord, near Talvik.

2.8 Owing to the importance of the British not learning the results of their attack, a strict silence was observed by the Germans.

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH. SEPTEMBER, 1944.

12.1. Extract from N.I.D. U.C. Report No.530 dated 13th September, 1944 giving a brief resume of the probable position regarding TIRPITZ (Based on information received up to 11th September, 1944.)

1.2 In a previous report (not reproduced) it was concluded that TIRPITZ might be ready to move at any time, but would not be fit for an offensive operation until she had been thoroughly refitted. Since that date carrier-borne aircraft have made a series of attacks on the battleship (17th July, 22nd, 24th and 29th August).

1.3 Secret reports suggest (B.2) that TIRPITZ was not seriously damaged by these attacks, and C. in C. Home Fleet does not claim to have inflicted material damage in any of them.

1.4 TIRPITZ is reported (B.2) to have carried out trials underway in Alten Fjord at the end of June, during the first week in July, on 24th July and, subsequently, on most days. According to several reports (C.2) she has attained a speed of about 20 knots. Her main armament is effective (B.2).

1.5 It was reported (B.2) at the end of August, that repairs were almost complete, the requisite repair material having arrived. About the same date, another report (C.3) stated that repairs had reached an advanced stage and that it was intended that the ship should return to a German port, probably Kiel, on the first favourable moonless night.

1.6 Conclusion:

- (a) Temporary repairs to damage sustained in the midget submarine attack of 3rd September, 1943, and the Fleet Air Arm attack of 3rd April, 1944, have probably been completed. Her armament is probably effective and she can steam, although only at reduced speed.
- (b) Facilities for docking are not available outside Germany and TIRPITZ may, therefore, attempt the passage south in the near future. The possibility of her carrying out a limited operation cannot, however, be excluded.
- (c) In the event of a German evacuation of North Norway, it is possible that TIRPITZ might transfer to another Norwegian base before completing her passage to a German repair port.

12.2. Extract from A.C.I.U. Interpretation Report No.S.A.2749 dated 23.9.44 Attack on Battleship TIRPITZ in Kaa Fjord

2.1 Information received on the attack

- (a) On 15th September, 1944, at approx. 1100 hours, twenty-seven Lancaster aircraft of Bomber Command attacked the battleship TIRPITZ in her berth at Kaa Fjord, North Norway.
- (b) Twenty-one aircraft each carried one 12,000 lb. bomb whilst the remaining six aircraft each carried twelve 400 lb. special bombs.
- (c) Photographs from twenty aircraft have been received.

2.2 General

At the time of photographs a very extensive and effective smoke screen had already covered the greater part of the fjord. However, the surrounding boom and small portions of a vessel in the usual position of the battleship can be discerned and those bomb bursts photographed show that an accurate attack was delivered. (D.N.C. Note - one photograph reproduced - Plate 12.2).

2.3 Position of TIRPITZ and the smoke screen

- (a) As stated under para. (ii) of this report the previous position of the TIRPITZ is well covered by that part of the smoke screen which emanates from the spit of land projecting immediately south of her berth. Furthermore, a considerable amount of the smoke which is seen over this position can be said to originate from points above sea level which would correspond with points on the deck and superstructure of the battleship. Two small sections of what are considered to be the outlines of a vessel and corresponding in position to the stern and port side of the TIRPITZ can be discerned beneath the smoke, but these do not permit the certain identification of the battleship on photographic evidence alone.
- (b) Crews of the first aircraft to attack state that the smoke screen was not then in operation and that they were reasonably certain that the battleship was lying in her usual berth on the Eastern side of the fjord. Although no certain photographic evidence of the presence of the TIRPITZ is available, in view of the above statement the location of bomb bursts will, for the purposes of this report, be related to the position occupied by the battleship when photographed on 12.7.44.

2.4 The attack as seen on photographs. (See also Figure 12.2)

- (a) Seven, possibly nine bursts, thought to be from the 12,000 pounders, and two groups of bursts probably of 400 pound special bombs, can be identified with certainty on these photographs.
- (b) The position of the bursts relative to the position occupied by the TIRPITZ on 12.7.44 are given under two headings, namely, those within the boom surrounding the battleship and those falling outside the boom.
 - (I) Those within the boom:
 - (i) One burst from a heavy bomb very close alongside the port quarter of the TIRPITZ.
 - (ii) One probable burst slightly forward of burst (a) and a little further away from the port side of the TIRPITZ.
 - (iii) One burst from a heavy bomb just within the boom at a point opposite the port bow of the TIRPITZ.
 - (vi) One possible burst on the stern of the TIRPITZ. No development of this burst is seen.
 - (II) Those outside the boom:
 - (i) Two bursts from heavy bombs on the small spit of land immediately south of the battleship, one at a point opposite her stern and one near the base of the spit.
 - (ii) Two bursts from heavy bombs in the fjord approximately 450 yards to the North of the bow of the TIRPITZ.
 - (iii) One burst from a heavy bomb on the hillside approximately 800 yards to the South of the TIRPITZ.

SECTION 12 - BOMBER COMMAND ATTACK AT KIA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

- (iv) One group of bursts, probably from small calibre bombs, on high ground approx. 950 yards E.N.E. of the TIRPITZ.
- (v) One group of bursts probably from small calibre bombs approx. 1700 yards S.S.W. of the TIRPITZ.
- (c) A sketch plan showing the position of these bursts accompany this report. It should be noted that the photographs available enable only some 30% of the total number of bombs known to have been dropped to be plotted.

2.5 Action taken by the enemy

- (a) A considerable number of flak bursts are visible over the target area. Two flak ships of HARALD HAAERFAGRE class are firing at the time of photography.
- (b) The smoke screen is operating from a very large number of points in and around the target area.

2.6 Annotated prints

An annotated print showing bomb bursts in the near vicinity of the TIRPITZ accompanies this report. (Figure 12.2)

12.3. Extract from Interpretation Report No.6927 dated 27.9.44
Photographs taken on 20.9.44. (Only one reproduced here - Plate 12.3)

3.1 General

This sortie, flown on 20th September, 1944, shows the whole of KIA FJORD and provides the first cover of the Battleship TIRPITZ since she was attacked by Bomber Command aircraft on 15th September, 1944. The majority of the vessels present are clearly seen, but unfortunately the battleship is in deep shadow which prevents a satisfactory report on the damage she may have sustained during the attack. The smoke screen was not in effective operation at the time of photography.

3.2 Position of TIRPITZ

The battleship is seen in her usual boom protected anchorage on the east side of the Fjord. She is emitting smoke. Her position within the boom has changed slightly since she was last clearly seen on 12th July, 1944, her bow and stern having swung a few degrees so that she now points in a more northerly direction. It will be remembered that Interpretation Report No. S.I.2749 (Section 12.2) was based on the assumption that she lay as on 12.7.44.

3.3 Damage to TIRPITZ

The battleship is seen on large scale photos, but heavy shadow and haze prevents a satisfactory damage assessment. Careful comparison has been made with the clear cover of 12th July, 1944 and the following points are noted:-

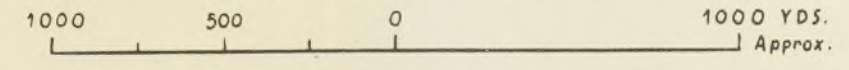
- (a) A large area of discolouration is seen immediately forward of "A" turret. This takes the form of a dark circular mark on the centre line of the ship with further discolouration extending out to both port and starboard sides. This area, at its centre, appears to have some depth, which may suggest penetration of the deck. Furthermore, abreast of this possible area of damage the lines of the hull appear rough and broken. However, it must be emphasised that no certain statement can be made on these photographs.

FIGURE 12.2

Bomber Command Attack on Battleship TIRPITZ
in

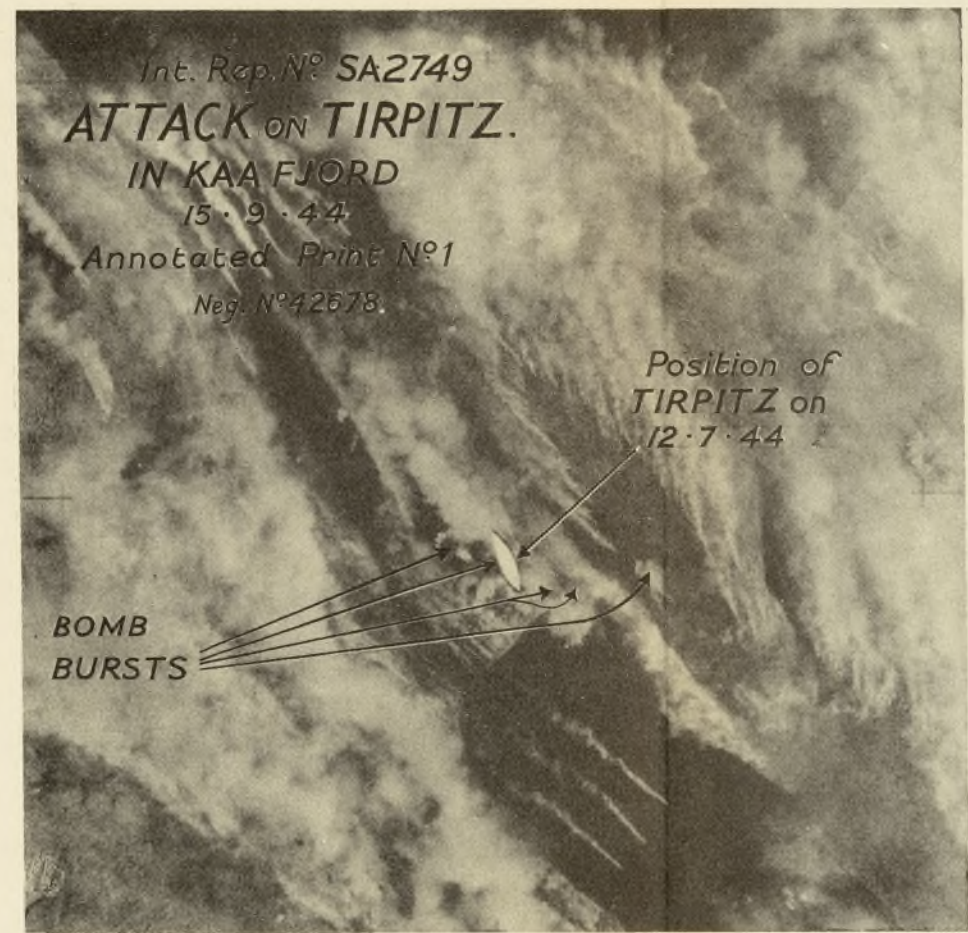
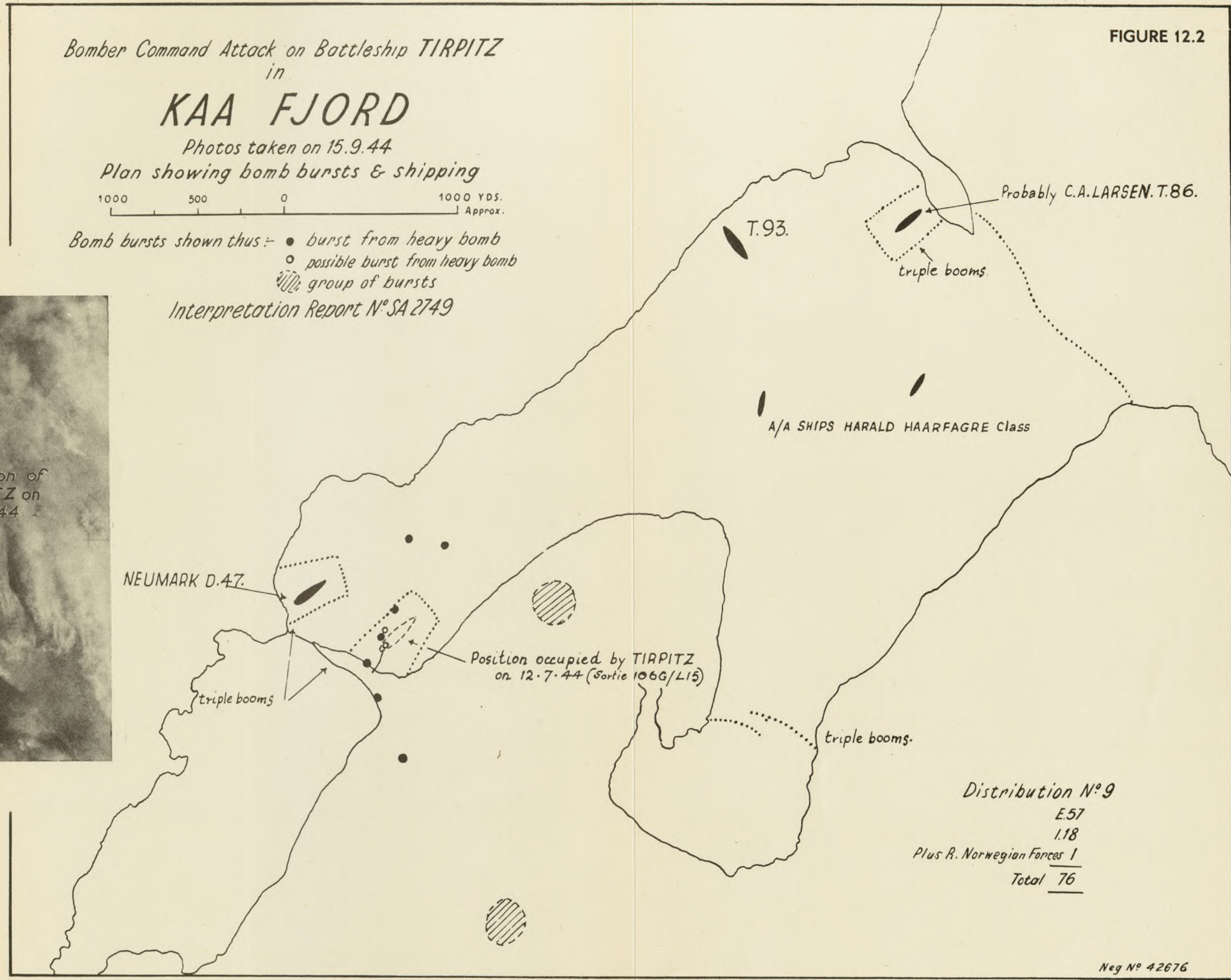
KAA FJORD

Photos taken on 15.9.44
Plan showing bomb bursts & shipping



Bomb bursts shown thus: ● burst from heavy bomb
○ possible burst from heavy bomb
▨ group of bursts

Interpretation Report N° SA 2749



Distribution N°9
E.57
1.18
Plus R. Norwegian Forces 1
Total 76

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

- (b) A small area of discolouration on the starboard side just forward of the secondary armament.
- (c) Nothing to suggest damage to the stern is seen. A possible hit on her stern was reported in I.R. No.SA.2749 (B.12.01). It was then assumed that she lay as on 12.7.44, but the slight change in position noted on this sortie would have placed the burst in the water alongside.
- (d) The TIRPITZ shows no list but it is thought that she may be slightly down by the bow. No certain statement can be made on the latter point.

3.4 Smoke screen

The smoke screen is not in effective operation at the time of photography, only a few ejectors being in operation.

3.5 Booms

Booms remain as on 15.9.44 except for the damage which has occurred to that protecting the berth opposite the TIRPITZ.

12.4. List of Secret Reports on TIRPITZ (Supplied by N.I.D.)

4.1 TIRPITZ sustained a direct hit on the starboard side which made a hole from the bow towards the stern 17 metres (56 feet) long. The hole is both above and below the water line and is so large that large motor boats could go in. Neither the turrets nor the fore part of the ship is under water, but just after the attack the ship had a list to starboard and the fore part of the ship was low in the water. The ship is now on an even keel but is still down by the head.

4.2 Two small Dutch ships which lay alongside TIRPITZ were blown into small pieces. These ships may have shielded TIRPITZ from the full force of the explosions. The only sign of repair work which one can see from the shore is that they have begun to remove the buckled plates around the hole.

4.3 TIRPITZ received a direct hit by a heavy bomb on her bow, which is sunk low in the water.

4.4 On Friday 15th, seventeen "Russian" aircraft attacked TIRPITZ. One hit on the foredeck was registered, and three small vessels were sunk. From land it can be seen that TIRPITZ is damaged. After this attack Kaa Fjord has the whole time been covered with smoke. (B.7)

4.5 It is reported that the forward part of TIRPITZ is under water, while a little of the after part is above water. (C.3)

12.5. Extract from N.I.D. U.C. Report No.535 dated 30th September, 1944.

GERMAN BATTLESHIP TIRPITZ

(Based on information received up to 28.9.44)

5.1 The German Battleship TIRPITZ was attacked by 27 aircraft of Bomber Command at 1100 G.M.T. on 15th September. Twenty-two aircraft dropped bombs, of which 16 were 12,000 pounders.

5.2 Reconnaissance photographs taken on 20th September show TIRPITZ lying at her normal berth. There is a large irregular mark on the forecastle, forward of "A" turret. No other indication of damage is visible but these photographs, supported by a report from secret sources graded C.3, suggest that

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

the battleship is down by the bows.

5.3 Two other reports, one graded B.2, the other C.2, state that she was hit by a heavy bomb forward.

5.4 Photographs taken during the strike are inconclusive, but suggest that in addition to one probable direct hit there may have been three "near misses".

Conclusion:

5.5 TIRPITZ received almost certainly one hit forward by a 12,000 lb. bomb. She may also have been damaged by near misses. It is probable that damage sustained is considerable and at least temporary repairs in Alten Fjord will be necessary before she is again fit to move.

12.6. Extract from N.I.D. L.C. Report No.955 dated 5th October, 1944.

GERMAN BATTLESHIP TIRPITZ

(Based on information received up to 4.10.44)

(Former: N.I.D. U.C. No.535 of 30.9.44 - see Section 12.5)

6.1 Further information has been received about damage sustained by TIRPITZ during Bomber Command's attack of 15th September.

6.2 It is reported (B.2) that TIRPITZ received a direct hit forward on 15th September and that a hole is visible on the starboard side slanting from the bow towards the stern. The hole is said to be both above and below the water line, about 55 feet long and big enough for a large motor boat to go in.

6.3 TIRPITZ is reported to have had a list to starboard just after the attack and to have been down by the bows. Later the list was righted, but she remained down by the bows. The only sign of repair work is said to be the removal of buckled plates around the hole. (B.2)

12.7. Extract from A.C.I.U. Interpretation Report No.7018 dated 30.10.44

7.1 Cover

1.1 This report is based on photographs taken, on 28 and 29.10.44, of the battleship TIRPITZ at her anchorage West of TROMSO. (The photographs are not reproduced here)

1.2 The first sortie covers the area on vertical photographs, the quality of the large scale ones being only medium, although that of the small ones is good.

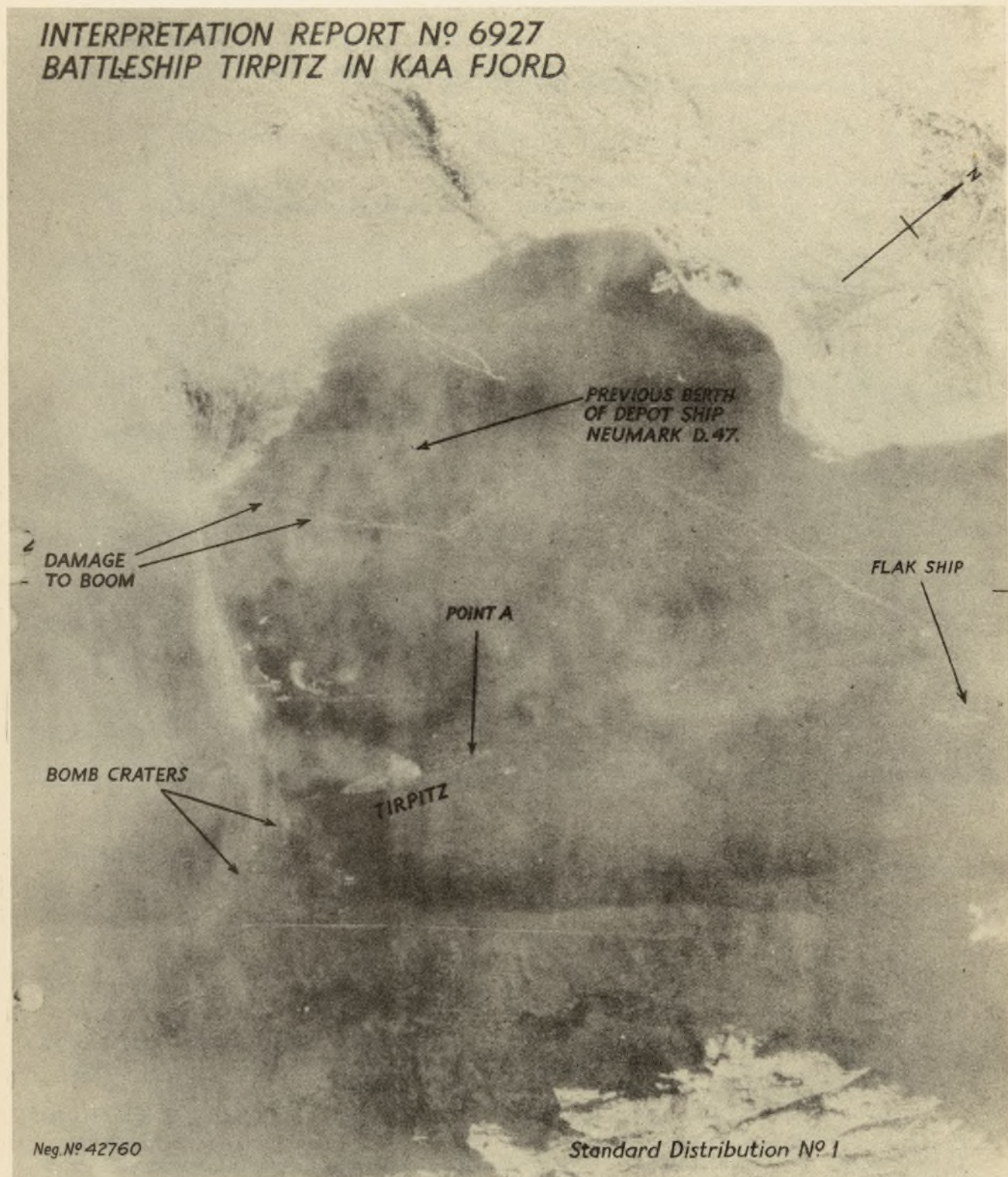
1.3 The second sortie flown a few hours after the bombing attack on the TIRPITZ by aircraft of H.Q.B.C., consists only of distant oblique photographs taken from the south, showing the battleship and other vessels at anchor nearby.

7.2 The battleship TIRPITZ on 28.10.44

(a) The battleship is seen south of HAAKOY island in the same position as on 18.10.44. Her bows are pointing east and she is lying in a rectangular boom-enclosure with some small vessels along her port side.

(b) An accurate statement on damage is not possible and shadow almost entirely obscures details of the port side. It does seem, however,

INTERPRETATION REPORT Nº 6927
BATTLESHIP TIRPITZ IN KAA FJORD



Neg. Nº 42760

Standard Distribution Nº 1

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

that the outline of the starboard bow is broken in places and, although the after deck of the ship is clear and obviously undamaged, the deck forward of 'A' turret and to starboard of 'B' turret gives an appearance of disorder and is darker toned than is usual.

7.3 The Battleship TIRPITZ on 29.10.44.

- (a) These distant obliques are taken from a point off the starboard quarter of the battleship and show her riding on an even keel in the same position as on the previous day.
- (b) No evidence of damage can be gained from these photographs.
- (c) At least two small vessels are within the boom enclosure on the port side of the TIRPITZ and appear to be making smoke at the time of photography.

7.4 Boom Enclosure

- (a) The boom, which is clearly seen, is a rectangle 1100 feet x 500 feet, the long side running E-W. It is double except at the N.W. corner where it is single and is attached to a jetty which extends 200 feet from the shore.

12.8. Extracts from N.I.D.07577/44 (Admiralty Official Paper)

8.1 Enclosed are:-

- (a) A.C.I.U. Interpretation report No.SA.2749 of strike photographs. (See Section 12.2)
- (b) A.C.I.U. Interpretation report No.6927 of reconnaissance photographs taken on 20th September. (See Section 12.3)
- (c) List of secret reports. (See Section 12.4)
- (d) N.I.D. U.C. Reports Nos. 530 and 535. (See Sections 12.1 and 12.5)

8.2 Further examination of the photographs taken on 20th September shows TIRPITZ definitely down by the bows.

8.3 D.N.C. is requested to estimate, in conjunction with other Technical Departments, the damage sustained in the latest attack.

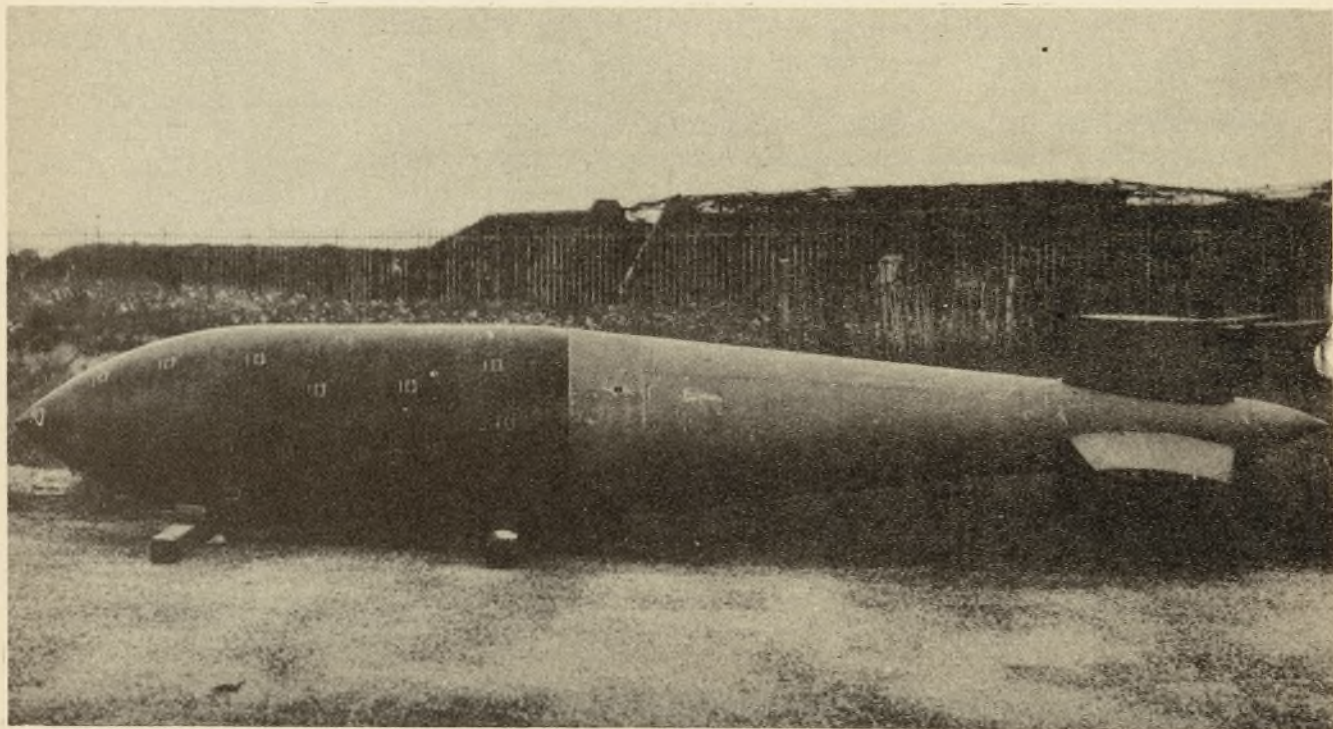
(Sgd.) H. CLANCHY.

for D. N. I.
1.10.44.

8.4 As no information concerning the construction and fuzing of the 12,000 lb. and special bombs is given hereon, these particulars were requested from D.N.I. (particulars given on plate 12.8). The question has also been discussed verbally with D. Arm. D., M.A.P. and a detailed drawing of the 12,000 lb. bomb has been examined. It is understood from D. Arm. D., that the fuze of the 12,000 lb. bomb might be expected to initiate on water impact and that the 400 lb. special bombs were of the J.W. Mark II type. It is also understood that the 12,000 lb. bombs were released from at least 12,000 feet.

8.5 The evidence suggests that TIRPITZ received a direct hit from a 12,000 lb. bomb in a position on the middle line about 110 feet from the bow and forward of 'A' turret and possibly one fairly near miss.

12,000 LB. M.C. BOMB ("TALLBOY")



PARTICULARS

Overall Length	21 ft.
Diameter (Max'm.)	3 ft. 2 ins.
Type of Filling	Torpex II.
Weight of Filling.....	5,100 lbs.
Charge/Weight Ratio.....	44%

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

8.6 Providing the bomb which secured the direct hit did not break up in its passage into the ship it is estimated that, with a fuze delay of .07 seconds, there was a reasonable chance of the bomb reaching the keel (or a position about the level of the keel if off the middle line) before detonation. If this occurred, it would be expected to result in immediate flooding of the bow compartments up to and including 'A' turret magazine and shell rooms, and a trim by the bow of about 15 feet. The structure within about 40 feet radius of the burst would be expected to be ruptured or badly distorted. To make the ship in this condition operationally seaworthy it would probably be necessary to rebuild forward of 'A' turret - a major operation involving docking for a considerable period. After temporary repairs it might, however, be possible to move her in fair weather at reduced speed to a major port for permanent repairs to be undertaken. After consultation with D. of D. it is considered that such temporary repairs would take at least two to three months to complete.

8.7 Regarding near misses with the 12,000 lb. bomb, it is estimated that if the fuze initiates on water entry, the time delay of .07 seconds would result in detonation at about 50 feet depth. Such an explosion occurring within about 100 feet from the side of the ship would be expected to cause widespread, although not necessarily heavy, damage to the shell plating such as dishing of the plating, starting of seams and rivets and possibly consequent flooding. The degree of damage would depend on the proximity of the explosion; if very near, the damage would be heavy but less extensive. There is no clear evidence that damage was sustained from near misses, but the possibility of damage by shock cannot be excluded. The work of temporary repair of damage due to a near-miss could probably be effected concurrently with the temporary repairs for the direct hit.

8.8 There appears to be no evidence of a hit or near miss with a 400 lb. bomb.

(Sgd.) C.S. LILLICRAP.

DIRECTOR OF NAVAL CONSTRUCTION.
16th October, 1944.

8.9 The following further evidence has been received:-

- (a) TIRPITZ was photographed by reconnaissance aircraft on 18th October, lying between Haakoy and Lille Grindoy in about 69° 38' 45" N., 18° 49' 20" E., headed E.N.E.
- (b) A B.2 report from Tromsø states that she was towed there on 16th October and adds that she cannot use her engines.
- (c) This was corroborated by another B.2 report which stated that she was escorted by a large number of ships.
- (d) Another B.2 report confirms that she has "a large split forward" and says that she has not steamed under her own power.

8.10 In the light of this evidence D.N.C. may wish to amend his minute.

8.11 Taking into account the confirmation of the hole forward, can D.N.C. estimate how long it would take to make the battleship temporarily operational?

(Sgd.) R. CAMPBELL.

for DIRECTOR OF NAVAL INTELLIGENCE.
19th October, 1944.

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

8.12 So far as the hull is concerned the additional information contained in D.N.I's remarks of 19th October does not add materially to that in the previous reports.

8.13 The fact that TIRPITZ has been towed to a new position is not in itself confirmation that she is unable to use her engines. The extensive underwater damage forward would make it desirable that the ship should proceed stern first and in the narrow waters of the Fjords would probably be unmanageable under her own power. If the report at (b) that she cannot use her engines is reliable, it would appear that the machinery has suffered damage by shock either by the bomb which penetrated the forecastle or by a near miss bomb. It is noted, however, that there is no reliable information as to the positions in which possible "near miss" bombs actually detonated. E. in C. referred.

8.14 Re para. 3 of D.N.I's remarks it is unlikely, from the intelligence reports received, that repairs could be undertaken at the northern base which would make the ship even "temporarily operational". The ship has sustained considerable damage in the various attacks and a period of at least 4 to 6 months at a main base (including docking) would probably be necessary before she could be made operational. As stated in D.N.C's remarks of 16th October, temporary repairs could possibly be carried out in 2 - 3 months which would enable the ship to proceed to a southern base either under her own power or with the aid of tugs, depending on the nature of the damage to the main machinery.

(Sgd.) C.S. LILLICRAP.

DIRECTOR OF NAVAL CONSTRUCTION.
23rd October, 1944.

12.9. Interrogation of Fregatten Kapitän (Ing.) Eichler

9.1 The attack on the 15th September took place at 1300 and was carried out by four-engined bombers (which Eichler thought were Lancasters) which came from ARCHANGEL.

9.2 One bomb hit the fore end of the ship on the starboard side just before the cable holders, passed out through the flare of the ship's side and detonated in the water under the ship. This bomb blew off or destroyed that portion of the fore end beneath the water and up to the armour bulkhead, and threw oil and water up on to the weather deck. Approximately the first 55 feet of the underwater portion of the hull was blown away and the ship became completely flooded to the waterline forward of station 203. As a result the draught forward increased by about 2.5 metres (8.25 feet)

9.3 It was estimated that the bombs were about 5.6 tons.

No attempt was made to carry out major repairs after this attack.

12.10. Interrogation of Kapitän zur see Junge

10.1 The attack was carried out by Lancaster bombers from ARCHANGEL, was made at 10,000 to 12,000 ft. with 12,000 lb. bombs.

10.2 One bomb hit the ship forward and severely damaged her below water, blew off an extensive portion of the fore end, causing flooding in Sections XX, XXI and XXII. The damage also extended above water and as a result of this hit the ship was unseaworthy. The upper and battery decks were both lifted up and buckled and the armour deck was arched up about one metre, (3.3 feet. The

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

port side plating was bulged outwards. There was also a near miss about 50 metres (165 feet) fine on the bow which did no material damage.

10.3 There were five casualties.

10.4 It was considered that direct hits with this bomb would have most serious consequences.

10.5 The ship was moved to Tromsø under her own power at a speed not exceeding 10 knots, to avoid further weakening of the structure. After this attack any idea of using TIRPITZ operationally was dropped. She was therefore anchored in shallow water but through an error of judgment the depth at the anchorage was 17 metres (56 feet) instead of 12 metres (40 feet) as had been supposed; that is, there were about 6 metres (20 feet) of water instead of 1 metre (3.3 feet) of water under her keel amidships.

12.11. Interrogation of Kapitän zur see Reinecke

11.1 When the attack commenced the ship was about to get underway for her first high speed trials, following the repair of damage to main machinery resulting from the 'X'-Craft attack. A large bomb detonated in the water close to the fore end, starboard side, and caused severe underwater damage. Makeshift repairs were carried out to stiffen up the damaged portion and an attempt was made to block a large hole in the starboard side with wood but the latter work was discontinued before much progress had been made. Reinecke considered that the type of bomb used has a devastating effect for direct hits but that it must detonate quite close to the ship to have very much value for near misses.

12.12. Interrogation of Konter-Admiral Peters

12.1 Admiral Peters, who was on board during the time, described this as the worst air attack he had so far experienced. He thought that 30 to 40 aircraft were involved in the strike. A smoke screen was put up and warning was given by shore radar installations which also directed TIRPITZ' main armament for putting up barrages in way of attacking aircraft. In all 134 guns were firing in defence of the ship, including the 38 cm. (15 inch approx.) main armament.

12.2 TIRPITZ received one hit and/or one near miss about 3 metres (10 feet) off the starboard side, forward which blew away about 40 metres (132 feet) of the fore-end of the ship underwater and forced up the decks above the water line. Peters had no real evidence of two bombs falling close together, but said that it was officially considered that one bomb would not have caused such extensive damage. All the ship forward of station 203 was wrecked and flooded and ship trimmed about 1 metre (3.3 feet) by the bow.

12.3 Counterflooding of wing compartments port and starboard aft was carried out by the damage control officer (a Korvetten Kapitän) and oil fuel was pumped out from the forward tanks between stations 180 and 202. In all about 1500 tons of water were admitted to the ship and the mean draught as a result of the damage increased approximately from 10 to 11 metres (33 to 36.3 feet).

12.4 Appreciable shock damage was received, most of the visual range-finding instruments being out of action. Steering gear was intact but the main machinery had to be overhauled and took 8 days to make serviceable. Only the auxiliary machinery was seated on special resilient mountings, and this was unaffected. There was also a certain amount of whipping since, although the masts were undamaged, the aerials were broken.

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

12.5 The whole of the stem was "hinged" on the port side and temporary stringers were welded in on the starboard side to stiffen up the structure.

12.6 The ship then proceeded to Tromsø at 8 knots. It was found that the wreckage at the bow did not seriously affect the steering so that tugs were not required.

12.7 One 12,000 lb. M.C. which hit the sandy shore near the stern of TIRPITZ caused a crater 40 metres (132 feet) diameter by 10 metres (33 feet) deep but the ship received no damage from this bomb.

12.13. Captured German Documents. (Extract from report N.I.D. 24/T34/45)

13.1 The attack of 15th September, 1944, on the vessel which was then lying in the Kaa Fjord was carried out by 30 Lancasters, including aircraft of the 617th Bomber Squadron, from the Russian airfield of Archangel, the aircraft having previously flown there from Scotland. The bombers flew in at a high altitude 4,000 to 5,000 metres (13,200 to 16,500 feet) in closed formation from the South-East. 10 to 15 kilometres from the Swedish frontier the aircraft descended to 2,000 to 3,000 metres (6,600 to 9,900 feet) and attacked in waves of 5 to 7 aircraft, mostly from the direction of the sun. Open formation was largely used.

13.2 It was repeatedly observed that the aircraft closed in before releasing their bombs. Immediately after doing so the groups broke up again. The aircraft then turned off singly in various directions. Those still carrying bombs repeated their attack at once either singly or forming up into twos and threes as they came in from different directions. The attacks were principally made in the direction of the fjord (i.e. parallel to the length of the ship).

13.3 As a result of this heavy attack, very serious damage was caused to the ship. The bow was hit and from hawsepipes to forward turret was almost completely destroyed. The main engines were also damaged by the vibration. It was estimated that repairs, if they could be carried out without interruption, would take at least nine months.

13.4 It was eventually decided at a conference on 23rd September, 1944, at which the C. in C. and Naval War Staff were present, that it was no longer possible to make the TIRPITZ ready for sea and action again. It was therefore considered that in order to preserve the remaining fighting efficiency of the ship, she should be used as a reinforcement to the defences in the Polar Area. For this purpose TIRPITZ was to be moved as soon as possible to the area west of Lyngenfjord, moored in shallow water and brought into operation as a floating battery. A suitable berth had to be selected, which would be reasonably secure and would offer favourable operational possibilities for the ship's armament. Adequate anti-aircraft, smoke-cover and net protection were to be provided. Makeshift repairs were to be made and the TIRPITZ moved with the assistance of powerful tugs.

13.5 The operation of moving the TIRPITZ was carried out on 15th October, 1944. A berth was selected near Tromsø, Haakoy net enclosure, by F.O.I.C., Polar Coast in co-operation with Flag Officer, First Battle Group. The ship was protected against under-water attacks and aerial torpedoes by means of a double net barrage. Shore anti-aircraft guns and smoke-screen units were moved from Kaa Fjord to Tromsø. As the ship was only partially seaworthy, the crew, particularly engine-room personnel, was decreased. It was found that there were varying depths of water at the selected berth; in particular there was a hollow below the midship section. Too many difficulties would have arisen if the ship were to be moved again, so it was decided to fill in the hollow till the water was 2 metres (6.6 feet) deep below keel. Work was commenced

SECTION 12 - BOMBER COMMAND ATTACK AT KAA FJORD ON 15TH SEPTEMBER, 1944 (Cont'd)

by dredgers on 1st November, and by 12th November about 14,000 cubic metres had been filled in at both sides below the midship section.

1214. Survey of wreck.

See 5.5 of Appendix B. (Volume 1)

SECTION 13 - BOMBER COMMAND ATTACK AT TROMSØ ON 29TH OCTOBER, 1944.

13.1. Extract from A.C.I.U. Interpretation Report No. S.A.2894 dated 4th November, 1944.

Photographs taken on 29.10.44 (not reproduced here)

1.1 Attack on Battleship TIRPITZ West of Tromsø

Information received on the attack.

(a) On 29th October, 1944, at approx. 0800 hrs., thirty-two Lancaster aircraft of Bomber Command attacked the battleship TIRPITZ in her berth four miles west of TROMSØ, NORWAY.

(b) Thirty-two aircraft each carried one 12,000 lb. bomb.

1.2 General

All of the photographs received are obscured by cloud, haze and smoke, and the stern of the battleship TIRPITZ is barely visible on one photograph only. Although her position can be discerned the available photographs do not permit a statement to be made regarding the success of the attack.

1.3 The attack as seen on photographs.

(a) Two bomb bursts are clearly visible on one photograph. Their positions relative to the position occupied by the TIRPITZ on 28.10.44 are, one burst approx. 300 yards E.N.E. and one burst approx. 450 yards East of the battleship's bows.

(b) A considerable amount of smoke and disturbance is seen in the vicinity of the battleship, but it is not possible to differentiate between that which may be the result of heavy flak and of bomb bursts.

132. Extract from N.I.D. U.C. Report No. 551 dated 3rd November, 1944

German Battleship TIRPITZ based on information received up to 31.10.44

2.1 Since the issue of N.I.D. U.C. Report No.535 (12.5), TIRPITZ has left Alten Fjord for a berth about four miles west of Tromsø, in position 69° 38' 45" N, 18° 49' 20" E. She arrived there on 16th October (B2) and was photographed on 18th October.

2.2 The battleship was attacked in this position on 29th October by 32 Lancasters of Bomber Command, each carrying one 12,000 lb. bomb. Light cloud made accurate bombing difficult and photographic evidence is not conclusive. Strike reports state that there were a number of near misses, and the ship may have sustained damage.

2.3 Further reports (B2) indicate that TIRPITZ sustained a direct hit forward during the attack of 15th September. Technical Departments calculate this hit to be in a position on the middle line about 110 feet from the bow, and they give the following estimate of damage.

2.4 Providing the bomb which secured the direct hit did not break up on its passage into the ship, there was a reasonable chance of the bomb reaching the keel (or a position about the level of the keel if off the middle line) before detonation. If this occurred it would be expected to result in immediate flooding of the bow compartments up to and including 'A' turret magazine and shell rooms, and a trim by the bow of about 15 feet. The structure within about 40 feet radius of the burst would be expected to be ruptured or badly distorted.

SECTION 13 - BOMBER COMMAND ATTACK AT TROMSØ ON 29TH OCTOBER, 1944
(Contd.)

2.5 The explosion of 12,000 lb. near misses within about 100 feet of the side of the ship would be expected to cause widespread, although not necessarily heavy, damage to shell plating, such as dishing of the plating, starting of seams and rivets and possibly consequent flooding. The degree of damage would depend on the proximity of the explosion; if very near, the damage would be heavy but less extensive. There is, however, no evidence, other than that of the original strike photographs, that damage was sustained by near misses.

Conclusion

2.6 To make the ship operationally seaworthy it will probably be necessary to rebuild forward of 'A' turret, a major operation involving docking for a considerable period. It is unlikely that repairs which would make the ship even temporarily operational could be undertaken at a northern base, and a period of at least four to six months at a main base (including docking) would probably be necessary to make her fully operational.

13.3. Interrogation of Fregatten Kapitän (Ing.) EICHLER

3.1 Eichler said that no hits were scored during this attack. He thought that the bombers' aim was put off by the excellence of the flak which was put up by TIRPITZ and shore batteries.

3.2 Some damage to the aft end was caused by a near miss which flooded the steering gear compartment and put the port shaft out of action.

13.4. Interrogation of Kapitän zur see JUNGE

4.1 After the attack on the 15th September, efforts had been made to set up a good warning system by establishing observation posts at considerable distances from the ship at strategic points. TIRPITZ received warning of this attack and as a result the ship was in a high state of readiness. No direct hits were scored but one near miss on the port quarter about 25 metres (83 ft.) from the ship's side bent the port shaft and damaged the rudder. In addition, the steering gear compartment and several other compartments on the port side were flooded over a length of about 35 metres (116 ft.).

4.2 They managed to pump out some of the flooded compartments.

4.3 There were three casualties.

4.4 He left the ship on the 4th November.

13.5. Konter-Admiral PETERS

5.1 Peters was on leave for both this attack and for the final R.A.F. attack, but the information which he gave was stated to be, to the best of his memory, from the official damage reports which were only circulated to senior officers.

5.2 Three bombs landed in the water astern of the ship but only one landed close, about 10 metres, (33 feet) to the ship off the port quarter. The rudder and screw were damaged and shafts could not be turned. 800 cubic metres of water entered the ship aft but was confined mainly to shaft passages and no serious leaking of decks and bulkheads occurred far from the detonation. There was no shock damage as far as was known and, in any case, the guns and radar installations were fully operational. In fact the ship now was completely immobilized, although she could use her armament. She was referred to in the official damage report as "die Schwimmende Batterie" (lit. = "the floating battery").

SECTION 13 - BOMBER COMMAND ATTACK AT TROMSØ ON 29TH OCTOBER, 1944 (Contd.)

13.6. Captured German Documents (Extract from report N.I.D.21/46)

6.1 In the morning of 29th October, 1944, an attack was made with bombs of various calibres, including 12,000 lb. bombs, by 37 Lancasters escorted by 14 fighters. At this time the ship was lying in Tromsø Fjord. The attack was carried out from bases in Great Britain touching on Swedish sovereign territory en route so as to surprise the defence by approaching from the East. Apart from one near miss the attacking bombers scored various hits in the vicinity of the vessel without however hitting the hull itself.

13.7. Survey of wreck

7.1 See Section B.3 (Volume I).

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944.

14.1. A.C.I.U. Interpretation Report No. S.A.2923, dated 21st November, 1944.

1.1 Information received on the attack

- (a) The Battleship TIRPITZ was attacked and capsized by a force of 29 Lancaster aircraft of 5 Group Bomber Command between 09.41 and 09.49 on 12.11.44.
- (b) Each aircraft carried one 12,000 lb. bomb.
- (c) Photographs were taken by each attacking aircraft. In addition, the force was accompanied by a Lancaster of the R.A.F. Film Unit equipped with three cinematograph cameras. These films, which show the progress of the attack, have greatly aided the analysis of bomb bursts and have served to co-ordinate the individual records.

1.2 Summary of the attack as seen on photographs

- (a) These photographs (four are reproduced in Plates 14.1(a) and 14.1(b)) illustrate the complete success of this attack, culminating in the capsizing of the TIRPITZ.
- (b) Although only the after part of the ship is clearly seen it is obvious that she sustained two direct hits and one near miss, all on the port side. The first hit was probably in the region of the port end of the athwartships catapult and the second in the region of the after range finder, while the near miss fell off the port quarter in the neighbourhood of 'Y' turret.

1.3 The disposition of the TIRPITZ

The battleship is lying off the south coast of HAAKØY Island, West of TROMSØ, with her bows pointing east, within the rectangular boom enclosure, as she was seen on 28.10.44.

1.4 The attack as seen on photographs

Note: Time intervals where given are based on the assumption that the cinematograph film was operated at a speed of 24 frames per second. The bomb bursts seen on these photographs have been numbered chronologically, both in the report and on the accompanying annotated prints (Plates 14.1(a) and 14.1(b)) and approximate bomb plot (Figure 14.1).

- (a) As the bombers approached the TIRPITZ she was seen to emit great quantities of smoke which hung like a pall above her, obscuring all but the stern from vertical vision.
- (b) A cone-shaped mass of smoke rising within the pall is seen on vertical photographs to emanate from a direct hit near the port end of the athwartships catapult. The flash caused by this bomb on impact is probably that seen on Annotated Print No.1.
- (c) The second burst observed fell in the water just outside the southern side of the boom and was followed at an interval of about one second by a burst on the southern tip of HAAKØY Island. See Annotated Print No.2.

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

- (d) One eighth of a second later a brilliant flash followed by an explosion is seen centred on the port side probably in the region of the after range finder. See Annotated Print No.2. Bomb No.4.
- (e) At the same time Bomb No.5 fell in the water inside the boom off the port beam.
- (f) About two seconds later bomb No.6 fell between the boom and the shore, followed at an interval of about a quarter of a second by bomb No.7 which fell inside the boom off the starboard quarter of the ship.
- (g) Bomb No.8 fell close inshore near No.6.
- (h) During the time interval between the falling of bombs No.8 and 9 vertical photographs show that the TIRPITZ plunged to starboard. A line of white froth is seen along the port side of the hull and four ripples on the starboard side of the stern. It is estimated that she was displaced approximately twelve feet.
- (j) Bomb No.8 was followed about one and a half seconds later by bomb No.9 which made a near miss off the port quarter, close to Y turret. The bomb burst quickly developed into a high column of heavy black smoke. No other bomb that fell into the water produced a similar disturbance.
- (k) One and a half seconds later a bright flash was observed amidships which did not develop as a bomb burst and therefore may have been due to exploding ammunition.
- (l) Bomb No.10 fell close inshore and about the same time great disturbance of water is observed between the ship and the shore.
- (m) Bombs Nos. 11, 12 and 13 fell in the water at least a 1000 ft. to the east of the ship.
- (n) Bomb No.14 fell at a late stage of the attack and is estimated from vertical photographs to have been close behind the stern.
- (p) Bomb No.15 fell inshore on east side of HAAKÖY Island and No.16 fell slightly south of No.12.
- (q) Some time after bomb No.9 fell a thin concentrated light coloured jet is seen rising from amidships. A burst boiler or the inrush of sea water into the boiler rooms would probably produce a similar result.
- (r) After just over half the plotted bombs had fallen the ship was scarcely visible, being obscured by smoke from her own funnel and guns and by the explosions and disturbances caused by the bombs.
- (s) The last photographs taken by the Cinematograph aircraft show the TIRPITZ capsized in her boom protected berth, with the greater part of the smoke having blown away.

1.5

Action taken by the enemy

- (a) As already stated in para. 1.4(a) the TIRPITZ emitted great quantities of smoke during the approach of the bombers. This hung like a pall above her and was added to during the attack by the smoke from her secondary armament.

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

- (b) Photographic evidence indicates that her main armament was not used, and 'Y' turret is seen clearly to be in normal fore and aft position. Regular gunfire appears to come from the central part of the ship until bomb No.4 has fallen, and then spasmodically until a very late stage of the attack.
- (c) Continuous flak was also seen from the two A.A. ships of HARALD HAAFAGRE Class situated one S.W. of GRINDOY Island and one off the East coast of HAAKÖY Island, from a medium sized vessel West of the battleship and from a large vessel, possibly the floating workshop NEUMARK, off the N.E. tip of HAAKÖY Island.
- (d) Land batteries on HAAKÖY Island also opened fire during the attack.
- (e) Later photographs by the film unit aircraft show that a medium vessel has moved near to the boom enclosure where the TIRPITZ has turned over on to her port side.

1.6 Strike attack reports

- (a) Experience of interpreting photographs taken during bombing attacks has shown that it is not usually possible to plot more than half of the bombs dropped. This is, of course, mainly due to the fact that the photographic record of the attack is rarely complete, and that during the attack, the target becomes obscured by smoke and bomb bursts.
- (b) In the attack on the TIRPITZ only sixteen of the twenty-nine bombs dropped have been plotted. As only the after part of the ship is visible during the attack and even that becomes rapidly obscured in smoke and explosions, more bombs may well have fallen on the target.

1.7 Accompanying prints and bomb plot

This report is accompanied by an approximate bomb plot (Figure 14.1) and four annotated prints. (Plates 14.1(a) and 14.1(b)).

14.2. Extract from A.C.I.U. Interpretation Report No. 7049 dated 14th November, 1944. (Photographs taken on 11 and 12.11.44)

2.1 Cover

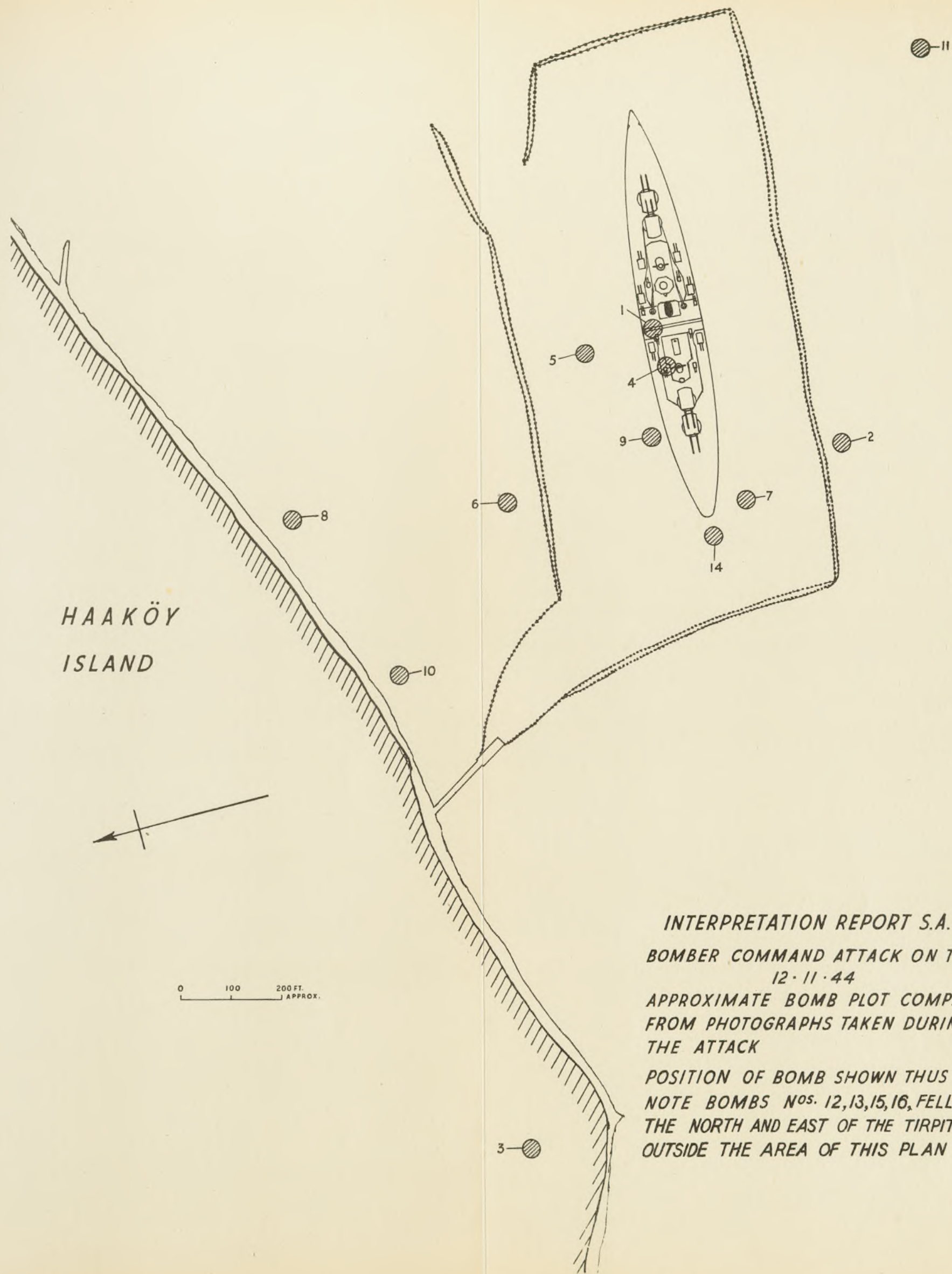
The anchorage of the battleship TIRPITZ and the surrounding area are covered on photographs of poor quality (not reproduced here). The sortie was flown 2½ hours after the attack on the TIRPITZ by Bomber Command.

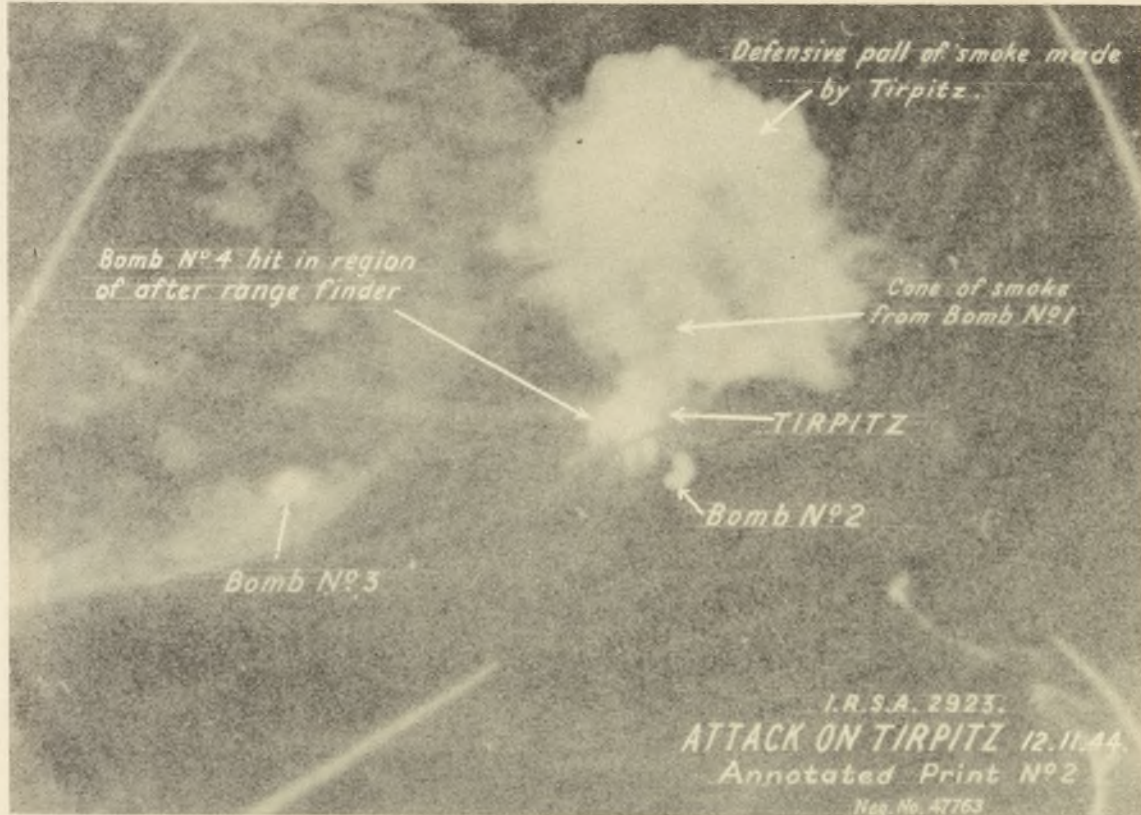
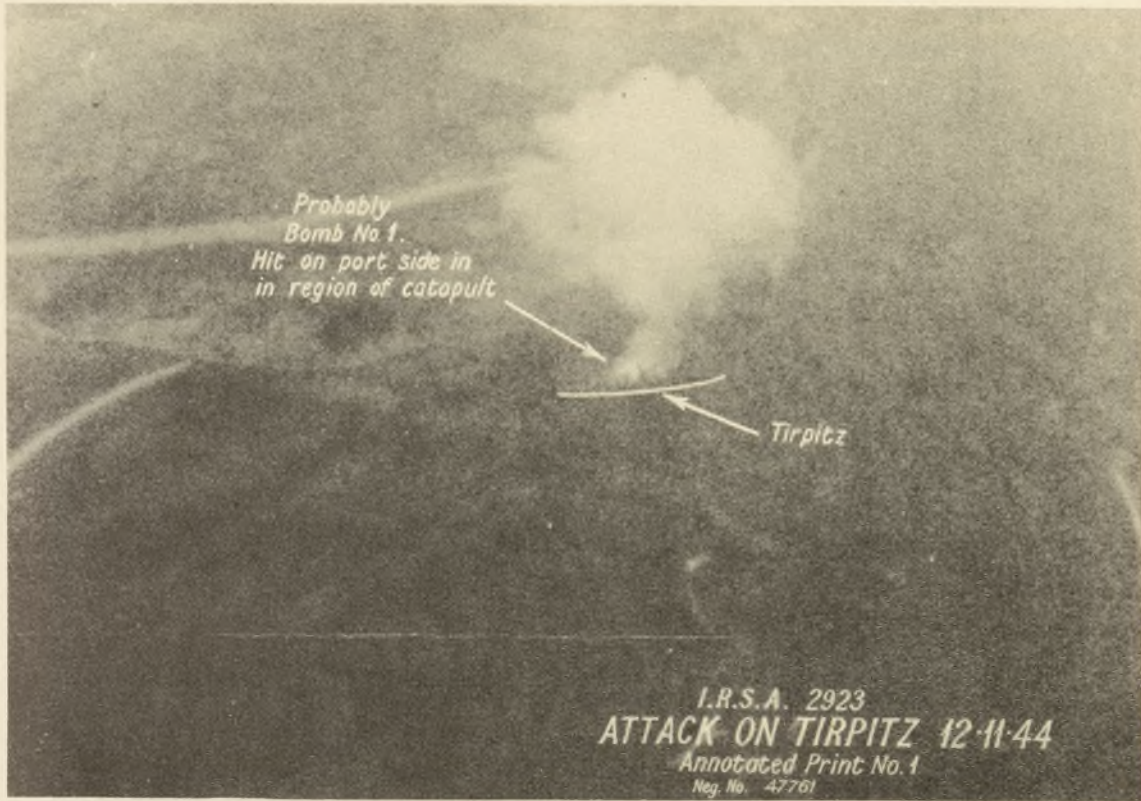
2.2 The Battleship TIRPITZ

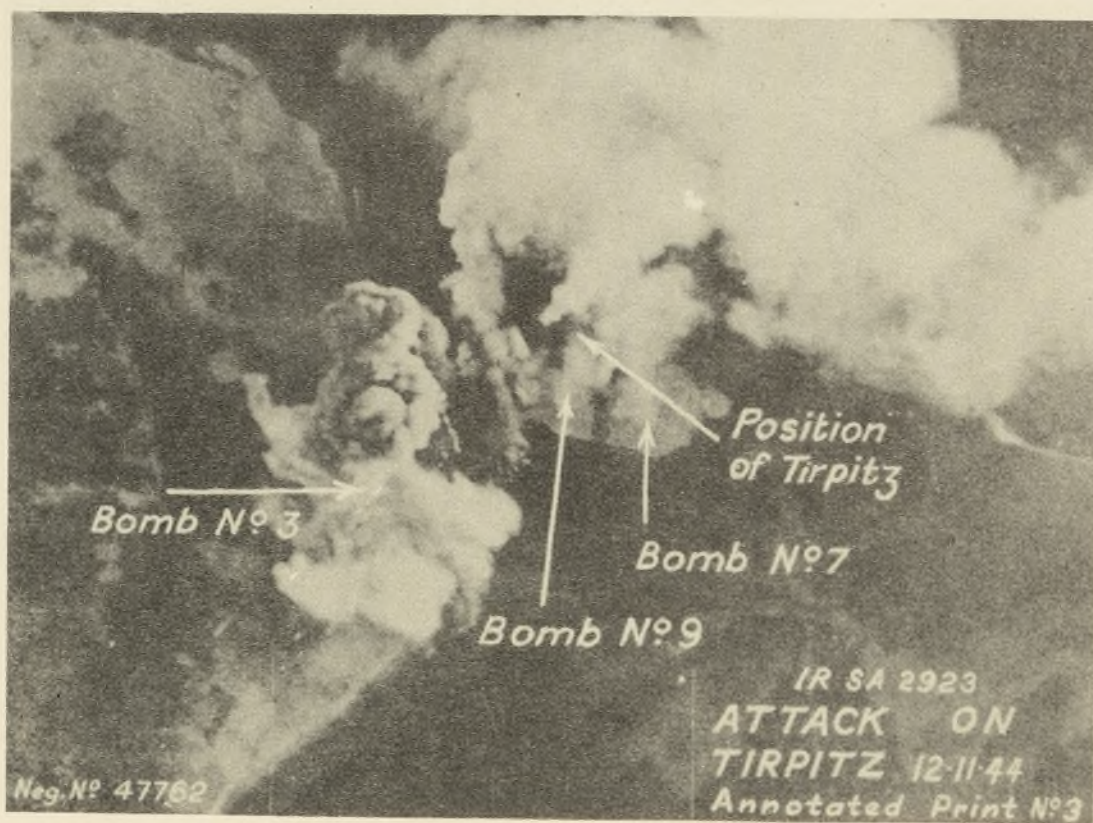
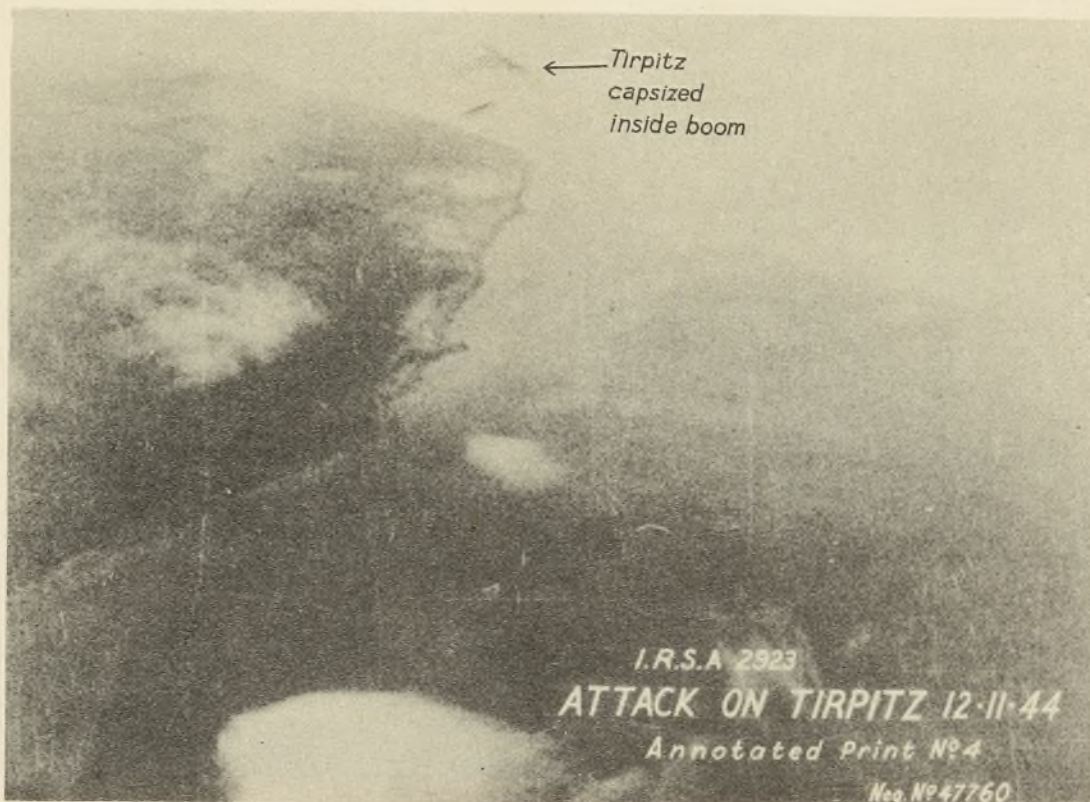
- (a) The battleship is seen capsized at her anchorage south of HAAKÖY Island, in the position she occupied on 29.10.44. Oil covers a considerable area of sea around the ship.
- (b) The only portion of the ship now visible is part of the bottom and starboard side. The former is seen from about the centre line of the keel to the starboard side in the transverse direction, and from just abaft the centre screw to the bow in the fore and aft direction.

The ship has therefore not completely turned turtle. This fact is thought to be due to her control tower and other upper works coming into contact with the sea bed in this comparatively shallow anchorage.

FIGURE 14.1







SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

- (c) The centre and starboard shafts are visible while the port shaft is under water. The total length above water is approximately 720 feet i.e. from the centre screw to the forefoot.
- (d) These photos do not permit a detailed statement on damage to that part of the vessel which remains above water but it is possible to discern two considerable breaks in the otherwise regular surface of the ship's bottom. These breaks are approximately in the area which lies between the control tower and the forward end of the citadel.

14.3. Extract from A.C.I.U. Interpretation Report No. A.235R dated 29th March, 1945.

Wreck of Battleship TIRPITZ

3.1 The capsized hull of the battleship TIRPITZ was photographed on 22.3.45 at TROMSØ, where she was sunk as the result of the Bomber Command attack of the 12th November, 1944. (D.N.C. Note - 3 of the photographs are reproduced in Plate 14.3).

3.2 One of the vertical photographs and two of the obliques show the wreck on a very large scale, so large, in fact, that each of the two obliques only shows part of the hull, one the fore end the other the after end.

3.3 Much of the hull is still covered with snow, which has only been partially cleared away for purposes of access to parts of the wreck. Salvage vessels and craft are alongside or near the wreck, but no major salvage operations are in progress. These vessels consist of four salvage ships and three smaller craft.

3.4 From examination of the available photographs no statement can be made on the damage which actually caused the battleship to capsize, as it is evident from the fact that the starboard side of the bottom is above water, that the fatal damage must have been done to the port side of the ship, which is completely submerged. This damage was evidently so severe that a large portion of the port side must have been destroyed, thus opening many of the port side compartments such as engine and boiler rooms, to the sea. As a result, the ship's buoyancy must have been affected in such a manner that her stability was lost, causing her to turn right over until her superstructures came in contact with the sea-bottom, leaving only the starboard side of the ship's bottom above water.

3.5 As to visible damage, the only statement that can be made is that an irregular hole can be seen just at the round of bilge of the hull on the starboard side, in an approximate position between 'X' and 'Y' turrets. The approximate size of the hole is 7 feet 9 inches x 4 feet 6 inches.

3.6 Other holes seen in the bottom are the main condenser circulating water inlets and outlets, seacocks, magazine flooding valves and some holes cut in the bottom, probably for rescuing members of the crew trapped in some of the bottom compartments not flooded as the result of the damage and capsizing, and probably also for the removal of fittings of value to which access is still possible inside the hull.

3.7 It can be observed that the starboard and apparently also the centre propellers have been removed, leaving the bosses of the shafts only. The propellers are generally made of phosphor bronze, a valuable material. It is possible, however, that work is proceeding with the removal of the port propeller, as there are two salvage vessels close to the stern. The TIRPITZ, like all German battleships, was a triple screw vessel.

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

3.8 There is no indication that diving operations were taking place at the time of photography, but one of the pontoons and rafts alongside the wreck may be a diving raft. There appears to be a ladder from this pontoon which is lying between the starboard side of the wreck and the salvage vessel lying some 40 feet from the battleship, leading to holes in the side between the bilge keel and the bottom of the armour belt, slightly abaft of amidships. The ship's side being in shadow, it is not possible to state whether these holes have been cut in the hull or whether they may have been the result of damage.

14.4. Extract from Air Ministry Report of Attacks on TIRPITZ

"Immediate Report on the German Battleship TIRPITZ"

4.1 Introduction

A Preliminary Bomb Damage Mission headed by Air Commodore Bilney of Bomber Command, and including Wing Commander Howell and Squadron Leader Whitehead representing the Air Staff, left the SHETLANDS on 20th May, 1945, in a Catalina of No.210 Squadron, to inspect the German Battleship "TIRPITZ" lying off HAAKØY ISLAND near TROMSØ in NORWAY.

4.2 Position of the ship

Following the attack on the 12th November, 1944, the ship was seen to have capsized at its anchorage and is now resting with its superstructure and port side on the bottom. The starboard side and most of the ship's bottom are visible above the water.

4.3 Inspection of the ship

An inspection of the hull confirmed the general position as stated above and revealed the following visible damage:-

(a) Bows

Severe damage consisting of torn plates with a large area buckled inwards on the starboard bow.

(b) Amidships

Close to the starboard bilge keel a large dent in the plating without rupture or holing.

(c) Stern

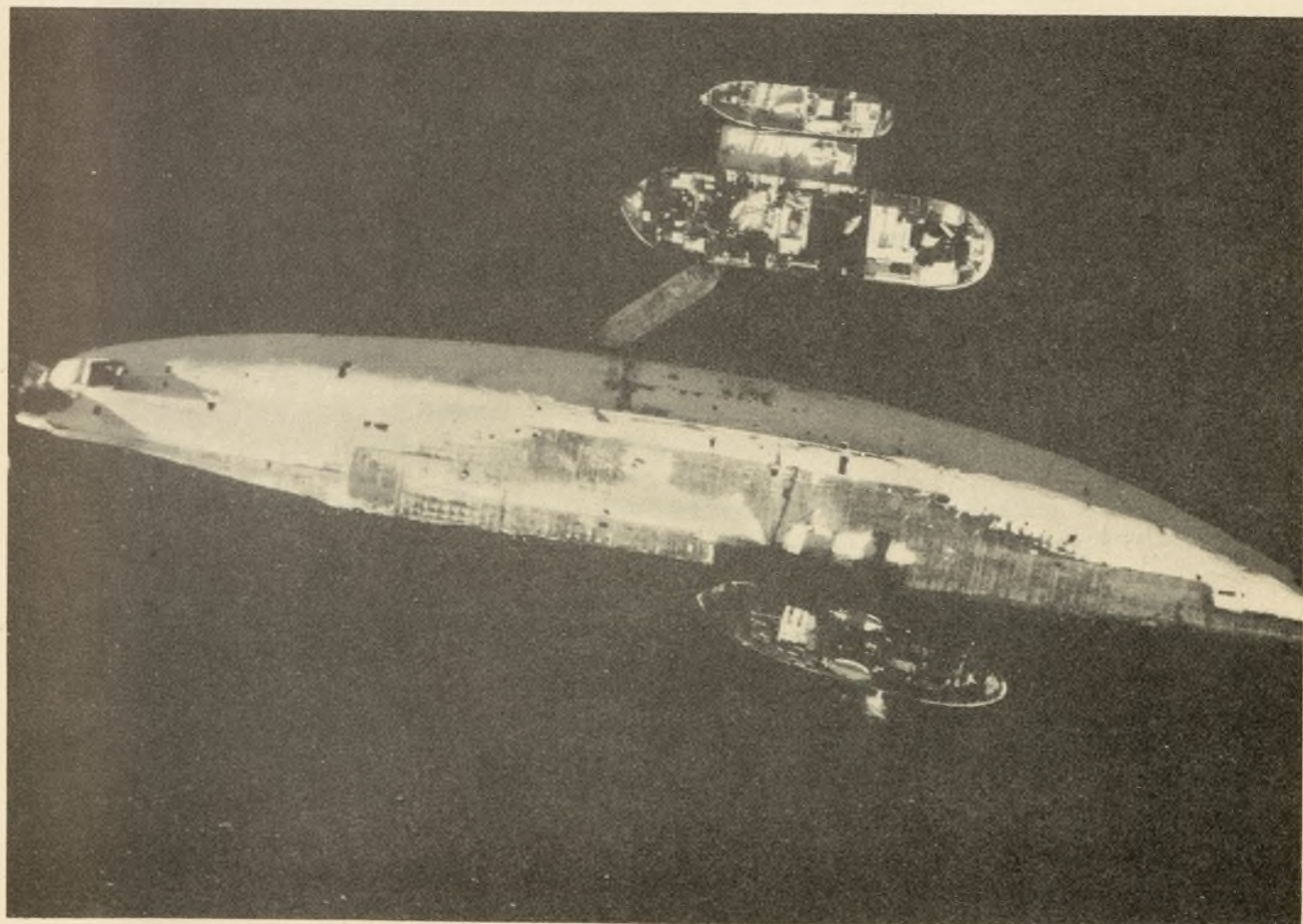
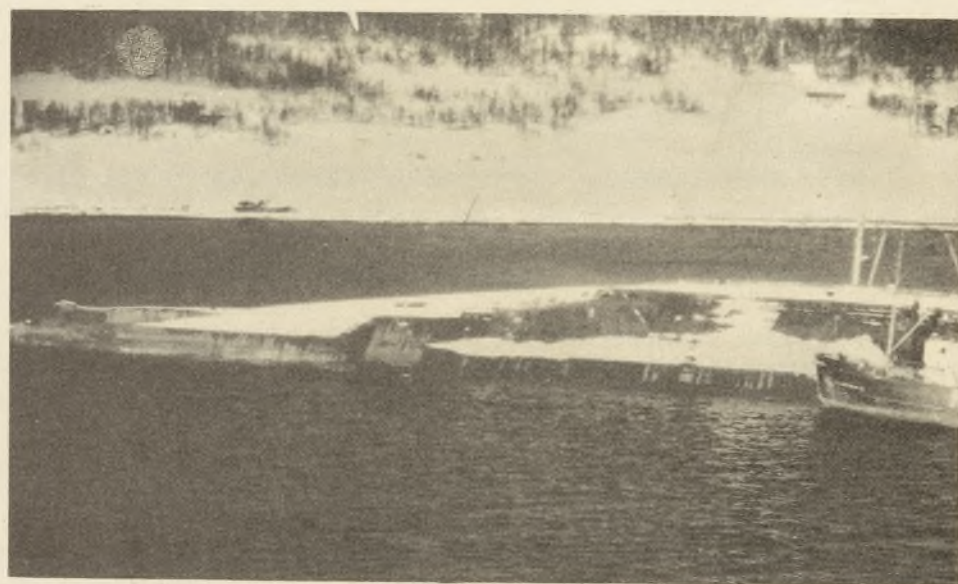
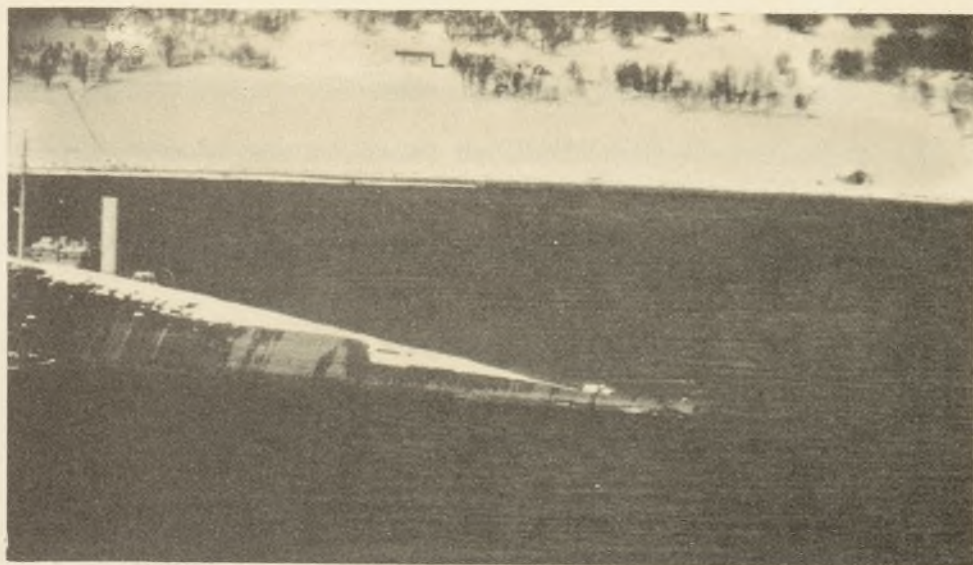
Cracked starboard propeller shaft housing with some damage to plating, most of which has been caused during salvage operations.

(d) Salvage Operations

Numerous holes have been cut in the plates of the ship's side and bottom to facilitate the rescue of survivors and the removal of fuel oil and other contents. Some of these permit access to the inside of the ship. At least one hole has been blown from the inside with an explosive charge during the rescue operations. Much of the main armour on the starboard side has been stripped and the propellers have also been removed.

4.4 Interrogation

A number of German Naval Officers and other personnel were interrogated about the attacks. Amongst the Naval Officers interviewed were:-



SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

- (a) Captain Liessman, Chief of Staff to the German Admiral commanding TROMSØ and POLAR SEAS
- (b) Commander (Baurate) Voss, Chief Engineer (Naval Construction) Naval Docks, TROMSØ

The information supplied from these and other sources indicates:-

- (i) The midget submarine attack resulted in one strike at the stern of the ship causing damage to plates and the propeller shaft as described.
- (ii) The attack by Lancasters at KAA FJORD caused severe damage to the ship's bows. As a result of this it was decided to move the ship to TROMSØ and there use her as a permanent fortification. Her speed was limited to 10 knots en route.
- (iii) The attack on the 12th November, 1944, at TROMSØ fjord sank the ship with a loss of about 1,000 of the crew (the normal complement of the ship was about 1900, but not all of these were aboard during the attack. About 200 in all were rescued none of whom, however, are stated now to be in the TROMSØ area).
- (iv) During this last attack two or three direct hits were obtained.
 - (a) One is reported to have knocked out the gun control position. This would account for the reported cessation of anti-aircraft fire from the ship early in the attack.
 - (b) One or two are reported to have struck amidships on the port side. It is not known whether penetration of the main armoured deck was achieved before detonation, but the entire side from deck to keel was said to have been burst open for a total width of "about 37 metres". The Chief of Staff's opinion was that the explosion took place below water level.
- (v) A subsequent explosion is reported to have occurred in the region of 'C' turret through fire caused by the bomb. It is not clear whether this explosion was confined to ammunition actually in the turret or whether magazines below the armour were involved. The exact effect of this explosion has not been established.
- (vi) After the bomb hit amidships the ship listed to port with increasing momentum and finally capsized about 20 minutes after the commencement of the attack.
- (vii) A near miss which dented the starboard side did not contribute to the loss of the ship.
- (viii) The attack was not a complete surprise as warning of the approach of our aircraft was received from BODØ. The absence of a smoke screen during the attack was due to the equipment being still en route from KAA FJORD.
- (ix) A full investigation was carried out by the Germans after the attack. The TIRPITZ and other capital ships had been placed under a special command and were not, therefore, controlled by the Admiral and his staff at TROMSØ. The report of the investigation is said to have been rendered to BERLIN through a Captain (Zur See) Peters at OSLO. It was thought that the German Naval H.Q. at OSLO

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

would have a copy although that officer had left OSLO some time ago. No copies of the report and no other written information or diagrams were said to be available at TROMSØ. The authorities there had only been concerned with salvage operations.

4.5 Other items of interest

Inspection revealed a number of bomb strikes on the land close to the ship. A broken 12,000 lb. M.C. bomb was found on the beach. It had fractured two-thirds back from the nose in the same place as the broken bombs already found at ARNSBERG and IJMUIDEN. A bomb disposal officer who had dealt with this particular bomb was questioned and he stated that he thought that the bomb may have ricocheted from the side of the ship. This might account for the absence of traces of the point of strike or the tail of the bomb. Part of the bomb filling was burned by the bomb disposal squad, but the remainder is still inside the nose. The tail portion of the bomb may well have detonated normally as at ARNSBERG and IJMUIDEN.

It was noted that there were a number of depth charges in the engine room of the TIRPITZ and apparently fresh leads connected them with the shore. Salvage vessels are still alongside the wreck although work was stated to have ceased. The possibility of demolition of the wreck was considered and the facts were, therefore, reported to a British Naval Officer at TROMSØ.

4.6 Conclusions

- (i) The TIRPITZ was seriously damaged in the bows and largely immobilised by a 12,000 lb. M.C. bomb while the ship was lying in KAA FJORD.
- (ii) In the last attack the ship was sunk as a result of 2 or 3 direct hits from 12,000 lb. M.C. bombs while lying near TROMSØ. A near miss damaged the hull of the ship but did not contribute to its loss.
- (iii) Details of the main damage cannot be seen as they are under water. German reports of the damage are considered to be reasonably reliable and are in part confirmed by the evidence of the strike photographs. The extent to which the armoured deck has been penetrated or damaged is not known as that side of the ship is reported to be embedded in the mud.
- (iv) The 12,000 lb. M.C. bomb has again been demonstrated to be weak at a point two-thirds back from the nose.

4.7 Recommendations

- (i) A further detailed examination of the port side and interior of the ship is considered desirable to ascertain the degree of penetration and the extent and cause of major damage.
- (ii) Further steps should be taken immediately to prevent demolition of the ship by the Germans as this appears possible at present.
- (iii) In the meantime the 12,000 lb. and 22,000 lb. demolition bombs should continue to be employed against capital ships (fused .07 secs. delay).
- (iv) The re-design of the 12,000 lb. and 22,000 lb. M.C. bombs should be pressed forward to eliminate the apparent weakness in the case. The possibility of forging the bomb instead of casting should be investigated.

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

- (v) Attempts should be made to secure written reports on earlier damage to and the final sinking of the TIRPITZ from German sources, particularly at OSLO. Captain Peters should be found and interrogated.

27th May, 1945.

145. Report by Air Commodore Bilney of a preliminary investigation into the sinking of the TIRPITZ.

5.1 The undermentioned Officers made a preliminary investigation on 21st to 22nd May, 1945, into the wreck of the TIRPITZ, lying in TROMSØ Fiord.

Air Commodore C.N.H. Bilney, O.B.E.	} H.Q.B.C. Coastal Command Air Ministry, D. Arm. R. Air Ministry, D.B. Ops.
Group Captain S.P.A. Patmore	
Wing Commander R.J. Oxley, D.S.O., D.F.C.	
Wing Commander W.B.W. Gracey, D.F.C.	
Wing Commander E. Howell, O.B.E., D.F.C.	
Squadron Leader R.G. Whitehead, D.F.C.	

5.2 Through the good offices of the Flag Officer i/c TROMSØ, Rear Admiral Danielsen, R.Nor.N., contact was made with the following German Officers who produced valuable information:-

Kapitan Zur See Lieseman, Chief of Staff to the Admiral
Commanding Polar Coast,
Korvetten Kapitan Monsen, Chief of Staff Coast Defence, Tromsø,
Baurat Voss, Chief Engineer, Tromsø Dockyard.

These Officers explained that none of the crew of the TIRPITZ was now in the TROMSØ area, and that as the TIRPITZ was a separate command, not under the Admiral Commanding the Polar coast, they had not had access to any official reports on the sinking of this vessel, and stated that any such reports would have been forwarded to Oslo en route for Berlin. These officers did, however, provide the following information.

5.3 The TIRPITZ had been so heavily damaged by an earlier Bomber Command attack, on 15th September, 1944, when lying in the Alten Fiord, that it was decided that it would be impossible to get her back to Germany for docking and major repairs. The ship was therefore moved from the Alten Fiord to the Tromsø Fiord, to be used as a floating fortress at the position in which she was sunk. The journey was made under her own power, but at a speed of only 8 to 9 knots. This was due to the very heavy damage to the vessel's bows caused by a hit from a 12,000 lb. bomb, supplemented by damage to the starboard propeller shaft tunnel from midget submarine attack.

Warning of the daylight attack by Lancasters of Bomber Command on 12th November, 1944, was received when the aircraft approached Bodo, but no smoke screen apparatus was available at the ship's new anchorage in the TROMSØ FIORD, and so the bombers were able to make a visual attack.

The informants agreed that the first bomb to hit the ship struck her almost amidships, and this was quickly followed by a second hit abaft and to port of 'C' turret; this latter bomb started a fire.

(Note: To avoid confusion port and starboard are referred to as if the ship was on an even keel).

Immediately after being hit, the ship, which had previously had a slight list to starboard, took on a list to port, and considerable damage was done to the

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

ship's side, but owing to the number of casualties (1000 out of 1900 crew on board at the time of the attack), shock, and the rapidity of events, no clear-cut picture was available as to the exact sequence of events, or damage sustained. Informants stated, however, that the bomb hits pushed the armoured decks downwards and opened a gap between the side of the ship and the decks. Twenty minutes after the first hit, an explosion occurred, and the cumulative damage tore a hole 120 feet long on the port side of the ship from deck to keel. The ship very shortly afterwards turned turtle to port, rolling through approximately 140 degrees, with the superstructure embedded in the sea bottom. The main armament was in action during the attack, but the informants could not say whether the explosion took place in the turret, or in the magazine. They did, however, say that events were too rapid for the crews to open the turret doors.

Rescue work was immediately put in hand, and in the first 24 hours 85 men were saved through holes cut in the bottom of the hull, but these operations were given up after 48 hours. Further holes were, however, cut to salvage the fuel oil from the ship.

5.4 The present state of the ship

The TIRPITZ has rolled through approximately 140 degrees, and the superstructure and turrets are reported to be embedded in the mud. The starboard bilge keel is nearly vertical, and most of the side armour has been removed from the starboard side, and, it was stated, taken back to Germany for other purposes.

From bow to stern, the following damage is visible.

(i) Bow

Approximately 100 feet of the bow has been destroyed, and the plating dished for a further 50 feet aft. This damage was caused by the 12,000 lb. bomb hit when the ship was lying in the Alten Fjord.

(ii) Midships

A near miss has severely dished in the outer bottom over a length of approximately 50 feet just above the bilge keel. The main frames are badly sprung inwards, and had it not been for the welded construction of this vessel, serious leakage would have occurred. In this ship the plates are butt welded together, and they are also welded to the stringers thus making a homogeneous but flexible structure. In spite of the fact that the outer bottom has been driven in to a maximum depth of approximately 4 feet, leakage was negligible, and in no case have the plates torn apart. From the contour of this dishing, it is estimated that the 12,000 lb. bomb burst some 60 feet from the ship's bottom, and it is of interest to note that in spite of this near detonation of 5,200 lbs. of Torpex, the ship's structure has stood up remarkably well.

(iii) Stern

At a point approximately 120 feet forward of the propellers, and just to port of the central screw tunnel, there is some slight dishing of the outer bottom, the cause of which is unknown.

The starboard propeller shaft housing is cracked, and the shaft is thought to be slightly out of line; this, it was stated, was caused

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

by the midget submarine attack when the vessel was lying in the Alten Fjord. The informants stated that the plating in this vicinity had been removed, and that new plating had been welded into position under water before the ship left for TROMSØ. At the moment an area of plating about 20 feet square has been flame-cut, and lifted by demolition charges, as a means of access for rescue operations.

5.5 Under water damage

As the whole of the deck and most of the port side is under water, it is impossible to see what damage has occurred in these areas, and this can only be established by a full and thorough investigation by divers. It is strongly recommended that diving operations should be commenced without delay, in order to establish precisely the damage which caused this "unsinkable" battleship to succumb to two bomb hits.

5.6 Informants were quite definite that no repairs had been made to the ship by concrete patching, as previously rumoured, and no trace of concrete could be found in the wreck.

5.7 Position of bomb craters

From the air, 10 x 12,000 lb. bomb craters were visible, and one broken 12,000 lb. bomb was found lying on the mud. This bomb was scored on its nose, and the body was slightly flattened, the fracture having occurred a few inches behind the spigot hole in the body. The German Bomb Disposal Officer was interviewed, and he expressed the opinion that this bomb had hit the ship and ricocheted approximately 200 yards to its present position on the mud, which is where he found it, and attempted to burn out the remaining main filling. This seems to be a highly probable explanation, as it is most unlikely that the bomb would have broken up on the muddy foreshore, and as the rear half of the bomb would have detonated in close proximity to the ship with .07 secs. delay fuzing, this would account for the third apparent hit shown on the strike photographs.

5.8 Summary

- (i) The TIRPITZ had suffered such heavy damage from the last Bomber Command attack when she was in the Alten Fjord, that the Germans gave up any hope of getting her back to Germany for repair, and moored her at the spot at which she was finally sunk, as a floating fortress.
- (ii) Owing to the particularly strong and flexible construction of this vessel, the close near miss with the 12,000 lb. bomb on the port side was spectacular but did not cause serious damage.
- (iii) The informants expressed the opinion that the ship would not have capsized, had not an internal explosion occurred, caused by a fire started from the second bomb hit.

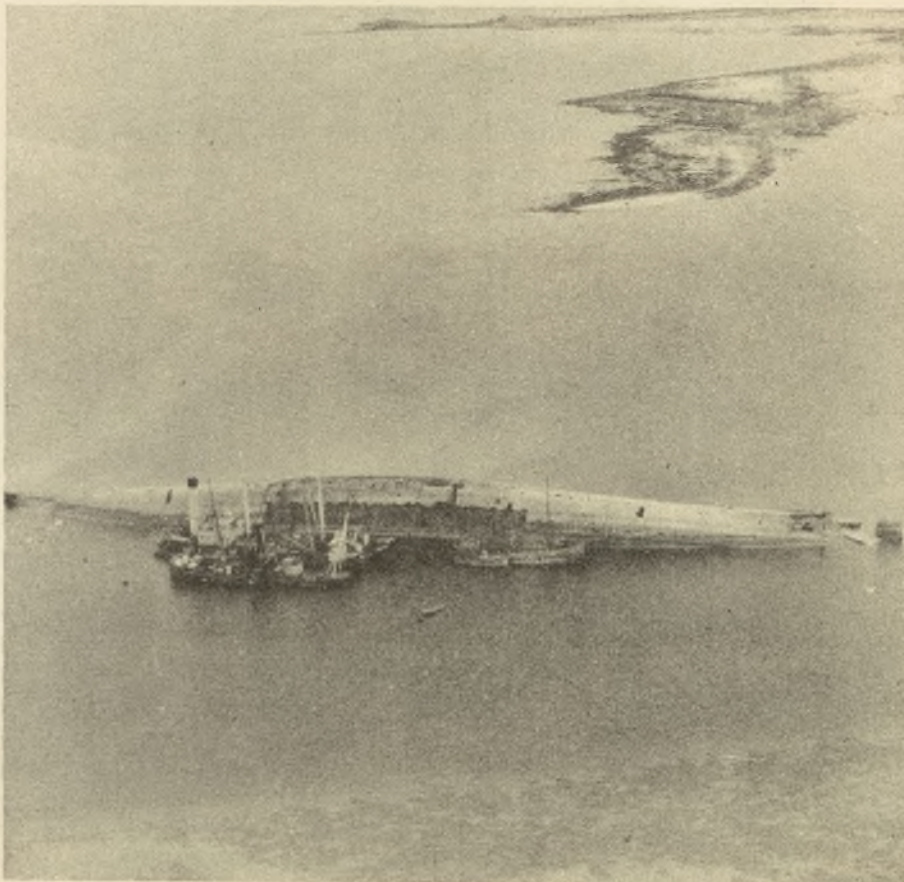
5.9 Recommendations

It is most strongly recommended that

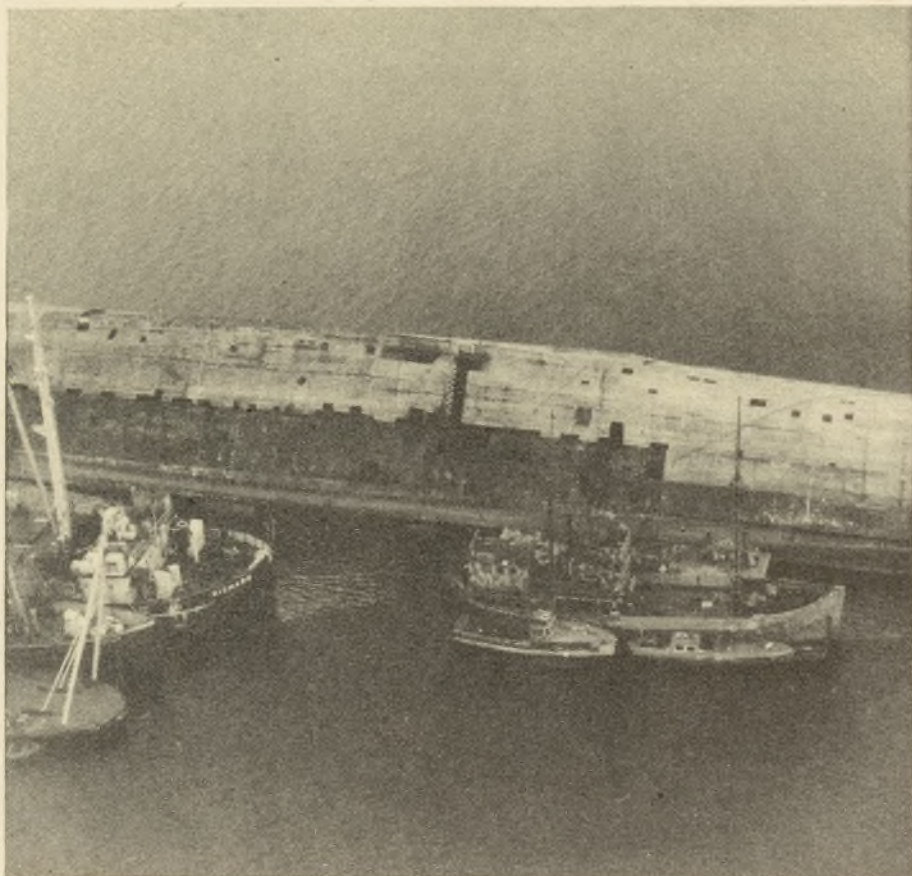
- (i) Naval divers be despatched without delay to assess the damage which has occurred to the portions of the ship now under water.
- (ii) Immediate steps should be taken to produce a forged design of the 12,000 lb. and 22,000 lb. M.C. bombs, to overcome failures due to the fracture of the case when subjected to side blows on passing through a labyrinth target.



GENERAL VIEW OF PORT SIDE



GENERAL VIEW OF STARBOARD SIDE



STARBOARD SIDE SHOWING ARMOUR REMOVED



STERN VIEW SHOWING DAMAGED RUDDER AND SCREWS REMOVED



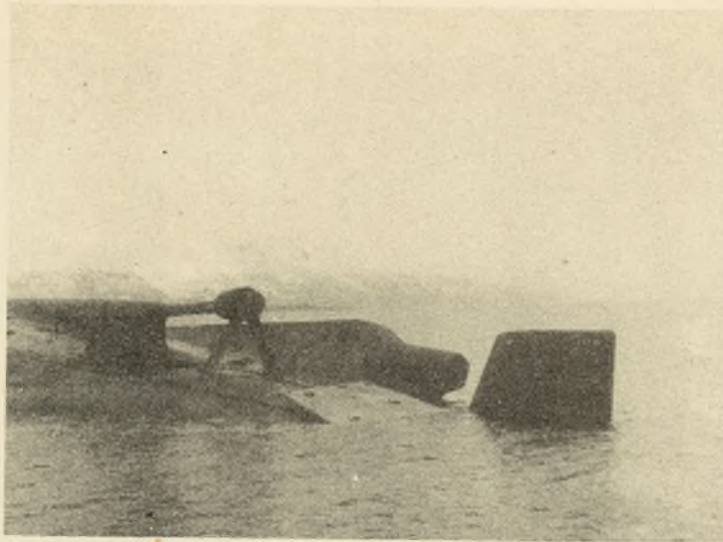
GENERAL VIEW FROM WATER SHOWING DAMAGED RUDDER



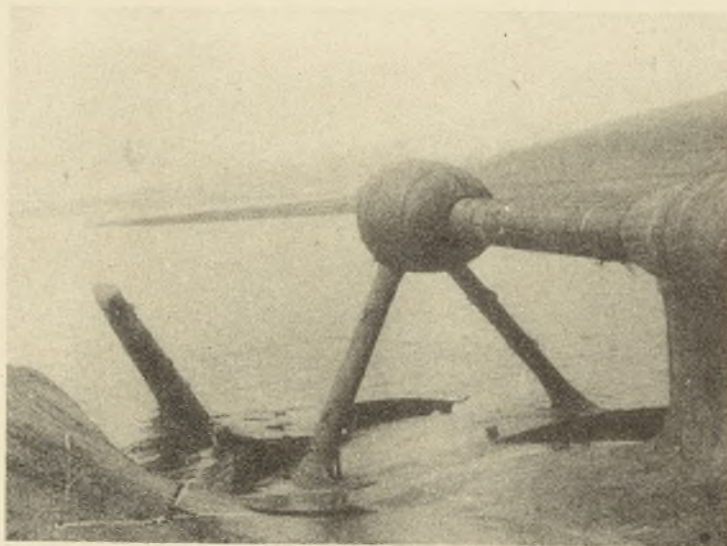
VIEW OF BOW DAMAGE BY 12,000 lb. BOMB HIT
APPROX. 100 ft. DESTROYED



VIEW OF DAMAGE FROM 12,000 lb. NEAR MISS
DENT 50 ft. LONG AND 4 ft. DEEP



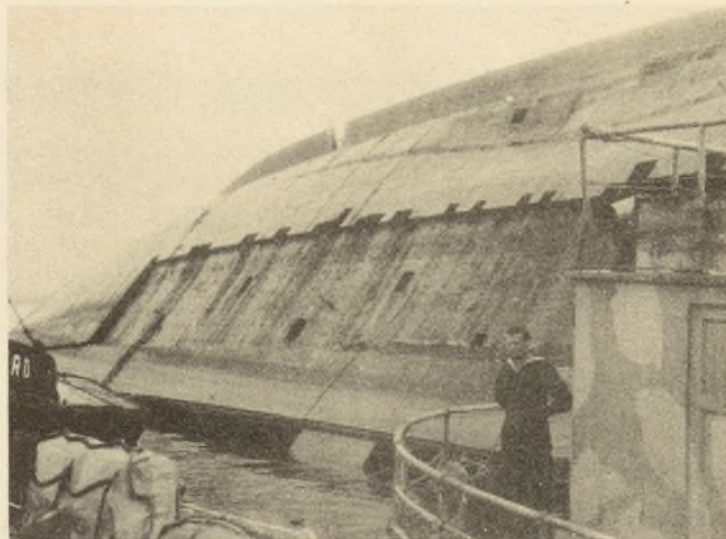
STERN FROM QUARTER



STERN SHOWING STARBOARD SHAFT



CRACKS IN STARBOARD SHAFT HOUSING
FROM MIDGET SUBMARINE ATTACK



←
Dent from
near miss
12,000 lb. bomb

STARBOARD SIDE SHOWING ARMOUR REMOVED



FRACTURED 12,000 lb. BOMB BODY
ON FORESHORE



FRACTURED 12,000 lb. BOMB BODY
ON FORESHORE

SECTION 14 - BOMBER COMMLND ATTACK AT TROMSO ON 12TH NOVEMBER, 1944 (Cont'd)

5.10 Acknowledgements

The mission wishes to acknowledge the assistance given by the Royal Norwegian Navy, in particular, the Naval Officer i/c, and Lieut. Commander Oi, Commanding Officer of H.Nor.M.S. Stord, who accommodated the party and rendered every possible assistance.

14.6. Interrogation of Fregatten Kapitän (Ing.) Eichler

6.1 He said that on this occasion the ship was attacked by forty bombers all with heavy bombs. There was one direct hit on the port side abreast the catapult and a number of near misses distributed along the port side as a result of which the whole port side up to the inner longitudinal bulkhead of the machinery spaces, from Section VIII to Section XIV, together with the port engine room, were flooded. He thought the direct hit detonated shortly after passing through the armour and estimated that about 12,000 tons of water entered the ship. TIRPITZ rapidly capsized to 30 degrees, remained there for a few moments and then continued to heel to 60 degrees, when 'C' turret was blown out, and then capsized completely.

14.7. Interrogation of Kapitän zur see Junge

7.1 Although he left the ship on November 4th, he was still the Commanding Officer and conducted the enquiry held on the loss of the ship. He said that she sustained one direct hit on the port side on the catapult at about 3 to 5 metres from the deck edge. A hit was also reported to port of 'B' turret as a result of which there were no survivors from the surrounding area including the Conning Tower. In addition there were 5 to 7 near misses off the port side. He thought they were more or less uniformly distributed and that they were mainly responsible for the loss of the ship. The ship inclined to 20 degrees in six minutes and completely capsized in 13 minutes. There were 15 metres of water under the ship at the time of her loss.

14.8. Interrogation of Kapitän zur see Reinecke

8.1 There was one hit on or near the port end of the catapult and possibly two more, one forward and one aft, though their approximate positions could not be stated. There were a number of near misses off the port side which caused extensive unsymmetrical flooding and resulted in the ship capsizing to port. The time from the commencement of the attack to the sinking was about 37 minutes. About 1,000 officers and men were drowned.

8.2 The following lesson was learned as a result of the incident:- The control tower was fitted with two armour access doors, one port and the other starboard, both doors were actuated mechanically. When the ship heeled to about 30 degrees the occupants endeavoured to escape but were unable to open the doors owing to their weight jamming the mechanical gear. The situation was explained by voice-pipe to men outside, but nothing could be done about the matter and in consequence all personnel in the compartment were subsequently drowned. As a result of this, O.K.M. (German Admiralty) issued instructions that in ships having a similar arrangement of armour doors to the control tower, action was to be taken to ensure that one of the doors was always kept open.

14.9. Interrogation of Konter-Admiral PETERS

9.1 Peters said that his account of this attack was based on his reading of the official report of a Board of Enquiry set up to ascertain the cause of the great loss of life resulting from the loss of TIRPITZ.

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

9.2 The main armament was used in defence because the coastal batteries were not at the time in operation.

9.3 There was one certain direct hit abaft the bridge and a possibility of two other hits, one forward of the bridge and one just before 'X' turret. However, official opinion was that the greatest initial damage was caused by 5 or 6 near misses which blew in a considerable length of the port side below the waterline. These near misses were believed to be within 5 to 20 m. of the ship's side. The reason for attributing the greatest damage to near misses was because the ship heeled 20 degrees to port in a few minutes, and it was not considered that the direct hit would have opened up a sufficient extent of the ship's side to admit rapidly the large quantity of water necessary to cause this.

9.4 It was considered that the hit or hits only served to augment the flooding between decks and that the primary cause of sinking was due to the near misses. Admiral Peters insisted that the starboard side was practically undamaged and he contended that the absence of any splinter holes on this side was the principal reason why he considered the direct hits not to have caused the initial flooding.

9.5 The TIRPITZ capsized eventually, going over in three stages, as follows:-

- (i) 20 degrees to port in a few minutes
- (ii) 70 degrees " " " 3 or 4 minutes
- (iii) 135 degrees " " " about 5 minutes

9.6 The ship listed over from 0 degrees to 135 degrees in about 10 minutes. When heeled over at 70 degrees an explosion occurred within the ship and 'C' turret was blown out.

9.7 About 1,000 officers and men lost their lives and there were about 700 survivors, 80 of whom were rescued after the ship had capsized by cutting holes in the starboard side. The most senior officer among the survivors was stated to be Kapitän Lieutenant Fassbender who was now "somewhere in Germany".

Note: Very few direct questions were asked concerning this last attack. Admiral Peters told the story substantially as given above. In particular, the statements about the near misses and direct hits were volunteered without any prompting. Peters stated that the official damage reports could be obtained at Neumunster or Coburg.

9.8 When asked why TIRPITZ had not left her fjord in Norway and sought action, Admiral Peters stated that he would have been pleased to have brought his ship out to sea but that during the whole tenure of his Command of the 1st Battle Group TIRPITZ was only operational for a few weeks in July, 1944. A further question was asked enquiring if, because of the loss of TIRPITZ, German Naval Circles considered that the capital ship had lost its value. Admiral Peters asserted quite definitely that the official view was that the capital ship still had a part to play, but that adequate air cover was essential for its successful operation. He stated that he had asked continually, without success, for a fighter group to protect TIRPITZ, and he thought that, had there been adequate fighter protection in Norway, his ship would never have been sunk.

14.10. Captured German Documents. (Extract from report N.I.D.24/T.34/45)

10.1 Report by German Air Force Intelligence: The third attack (on TIRPITZ) with 12,000 lb. bombs was carried out by 29 Lancasters on 12th November, 1944. At this time the ship still lay in TROMSØ FJORD. The attack

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

was made from bases in Great Britain, the outward flight carrying the aircraft in a wide detour over Swedish territory so that they flew in from the east in small groups of four to five at about 3,000 metres. During the run-up no evasive action was taken in spite of the heavy flak. The ship sustained 3 direct hits from the first bombs dropped and was thus put out of action.

10.2 According to the report submitted after the action of 12th November, 1944 by Lieutenant Fassbender, the senior surviving officer, the state of complement of the TIRPITZ at the beginning of the action is given as follows:-

- (a) Personnel: With the exception of the members of the crew who had been disembarked, the full complement was on board.
- (b) Material: Armament ready for action. Torpedo warheads and aircraft bombs had been given up; also all ship's aircraft with crews. The engine could be run for limited periods. Generator in order. The quantity of fuel oil carried amounted to 2000 cubic metres; heavy diesel oil - 300 cubic metres; water - 500 cubic metres. As a result of bomb hits scored on 15th September and near misses on 29th October, there was a considerable amount of water in the bow and stern. Draught was about 10 m. The ship was heeling 1 degree to port.

10.3 A translation of Lieutenant Fassbender's account of the course of the action is given below:-

12.11.44

Weather conditions: 0800: Clear, cloudless, very good visibility
Wind S.W. 1-2, Sunrise about 0930, High water 1100.

About

0800 W/T signal reporting penetration of one Lancaster in Bodø area. As penetrations of four-engined bombers are likely to have special significance, a clarification of this report was requested from the main observer post.

About

0815 Penetration of 3 Lancasters reported near Mosjoen, course East (tactical time 0738). On account of this report an attack by four-engined formations similar to that on 29th October, is anticipated, as the circumstances are similar - time of day, weather and approach. Telephonic consultation between A/A gunnery officer and officer-in-charge of main observer post (Lt. Hamschmidt) for the purpose of clarifying the air situation and securing fighter protection.

About

0825 Another 4 Lancasters reported, course N.E., in Mosjoen area. It therefore strengthened our suspicions that the enemy intended to attack. Consultation between First A/A officer, Lieutenant Herer and main observer post. Fighter protection requested from divisional control at Bardufoss. Enquiry made regarding strength and course of formation. Fighter protection not yet granted up to the present. Up to 0840 no further report on air situation. A/A alarm given as a precaution.

0854 Report from main observer post: 7 monoplanes (one-engined) 50 km. N.E. Simultaneous carrier attack suspected and air raid alert given.

0855 Air raid alert. Also for Tromsø. As report of 7 monoplanes originated from an auxiliary observer post at an Army coastal

SECTION 14 - BOMBER COMMAND ATTACK AT TROMSØ ON 12TH NOVEMBER, 1944 (Cont'd)

battery, and as no further reports on the subject were received, the report appears to have been false. In spite of this, the alert remains, as special significance must be attached to the four-engined bomber formation approaching from the South.

0902 Ship made ready for action. Stand to.

About

0900 Signal from main observer post: Situation still not clear; no more reports available.

About

0905 Open formation of about 20 to 25 aircraft sighted 120 km. to the South. From now on intentions of attack on TIRPITZ are obvious. All eyes keep watch on the formation. First its course is N.E., then it turns at a distance of about 70 km. to make a direct approach. From the time of the first sighting fighter protection has been requested continuously via the main observer post. About 0912 a second formation is sighted in the south and simultaneously reported by the main observer post. The formations are flying at a height of about 2500 to 3000 m. Upon repeated requests for fighter protection a signal is received about 0915, as follows:- Enemy formation over Bardufoss, therefore impossible for fighters to take off.

0915 Captain: Fighters have been requested.

About

0925 One fighter reported to have taken off; shortly afterwards more fighters.

0927 Captain to All: We are expecting a heavy air attack and the ship's company of TIRPITZ will again fulfil its duty and prepare a hot reception for the four-engined bombers.

0927 Smoke flares sighted from first formation at about 40 km. distance; the formation forms up into groups each of 4 to 5 machines flying at great height and prepares for the attack. Meantime the second formation has thinned out. Contrary to previous experience, the attack commences not in the fore-and-aft direction but athwartships from the starboard side on a bearing of 060 to 070 degrees.

0938 Captain to Senior Gunnery Officer: Permission to fire when bomber formation within range.

0940 Forward main armament opens fire at about 210 hm. At about 150 hm. range secondary armament and heavy anti-aircraft armament also open fire. The bursts of the first main armament salvo were low, the range was good. In spite of well-directed secondary armament and main anti-aircraft fire, the aircraft proceed steadily on their course of attack. The medium and light anti-aircraft guns came into operation mostly only after the bombs had been dropped. On the approach of the formation, one was observed to be shot down.

0942 A stick of bombs of heaviest calibre fall in close proximity, mostly inside the net enclosure. Two direct hits are observed on the port side, one on the aircraft catapult and one beside 'B' turret. The ship is flooded by high water columns, and a few seconds later lists heavily (15 to 20 degrees) to port. From the effect of the first hit there is a marked decrease in

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defensive fire, due to casualties in material and personnel. In spite of the increasing list the fire from heavy and light anti-aircraft guns is kept up until shortly before the capsizing. Shortly after the first bomb-hits the order was given by the repair party control to correct trim by flooding.

About

0945

Listing about 30 to 40 degrees

Order from Captain: Abandon lower decks.

Shortly afterwards, Captain to Gunnery Officer: Fire everything possible.

About

0950

Listing 60 to 70 degrees. 'C' turret goes up with a tongue of fire. Cause unknown. At this time there were still three aircraft over the ship. Bomb-hits near 'C' turret were not observed. It is supposed that the explosion was caused by the ammunition catching fire. List increasing quickly.

About

0952

The ship capsizes to port and is lying at an angle of about 135 degrees. A small number of the crew were able to remain on the capsizing ship. The rest of the men on the upper deck tried to reach land by swimming or with the assistance of floats or objects drifting around. After about $\frac{1}{4}$ hour the first rescue vessels arrived.

After the capsizing there were no more bombs dropped. One aircraft circled once more at a height of about 2,000 m. over the anchorage. Their withdrawal was not observed, presumably it was carried out as on 29th October, in single groups to the south-west over the sea, or to the south-east over Swedish territory. Armament was on the whole efficient. Fighter protection was lacking. There was no smoke-cover.

Two direct hits by bombs of heaviest calibre were certain and several near misses were observed. The effect of the bombs could be estimated from the bomb craters on the Island of Haakoy; the bombs had fallen in massive rocks and the craters had a diameter of 30 m. (approx. 100 feet) and a depth of 10 m. (33 feet).

3.1 Material damage

- (a) Hull: Serious flooding on port side from Section VIII to XVIII. Immediate list 15 to 20 degrees. Main mast breaks close on the signal position aft.
- (b) Gunnery: As a result of direct hits and near misses there was a breakdown in all electric current for 'C' turret. A hit on the aircraft catapult caused damage to port I and III 15 cm. turret and port II and III 10.5 cm. twin-mounting anti-aircraft gun. The effects of blast caused damage to single light anti-aircraft guns. Middle anti-aircraft control position put out of action by vibration. Individual anti-aircraft guns were jammed as a result of the main-mast carrying away. The whole armament, particularly the supply of ammunition, was defective as a result of the heavy list.
- (c) Engines: Generators 2 and 4 out of order. Breakdown in current supply for 'C' turret, Port II and III 15 cm. turret. Breakdown of telephones. No further details could be

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given about defects in engine-rooms, as up to that time no reports from eye-witnesses were available. Shortly after the first hit the engine control position must have been put out of action, because it did not answer when called up.

- (d) Communications: As a result of the main-mast carrying away almost all aerials put out of action; most transmitters and receivers were put out of action from the effects of vibration and the ship listing.

3.2 Capsizing of ship

From the effect of a hit on one side considerable flooding took place, in particular in the large engine-rooms on the port side amidships.

Other compartments were flooded when the upper deck became submerged; this was caused by the opening of the ventilator shafts and water-tight doors, when personnel vacated the lower compartments. The eventual capsizing took place following the loss of freeboard on the port side, the loss of trim and the increasing list.

The ship grounded at the bows and stern, the broad middle part of the ship sank into the hollow which had not yet been sufficiently filled up, causing the port bilge keel to be broken off. It was thought that considerable changes had occurred in the sea-bottom from the effect of bombs which had fallen in the vicinity, particularly in the earth which had been filled into the hollow. When the ship capsized the foremast must have been cracked by the shifting of the mud on the sea-bottom, causing the ship to rest on the port superstructure fore and aft.

When the ship capsized the cables, by which the ship was moored fore and aft, held. The forward moorings had to be cut to allow the repair ship NEUMARK to come alongside. At low water the starboard bilge keel (highest point) rises about 8 m. (26.5 feet) above the surface of the water, the edge of the upper deck starboard just emerging from the water.

3.3 Abandoning ship and first rescue operations

On account of the greatly increasing list of about 40 degrees, the order was given to vacate the lower decks. From the following unexpectedly swift capsize, most of the men on the lower decks were not able to reach the upper deck. Only individual turret crews were able to escape. While the crews of the after fire-control position were still able to open the heavy armoured door of the forward fire-control position.

The greater part of the crew on the upper deck saved themselves by swimming, or by the aid of floats on the net barrage or rafts from shore. Those who swam were greatly hampered by oil on the surface of the water. When 'C' turret blew up some of those in the water were killed by the blast or by splinters. (The report goes on to give details of the rescue operations, and mentions the saving of 85 sailors in the lower decks by cutting through the shell plating).

In the section of his report on the experience gained from the action the following paragraph is included:- "When considerable flooding takes place as a result of bomb hits, the vessel lists so heavily that there is no time to correct trim by flooding, and, in any case, it is impossible to correct trim by flooding on account of the nature of the flooding valves. It is therefore of importance when the load carried is small, to increase stability by previously flooding the lower empty tanks".

Lieutenant Fassbender's report is dated 4th December, 1944.

10.4 Events following the sinking of TIRPITZ

4.1 In a signal from Admiral Doenitz to the Führer's headquarters dated 13th November, 1944 he stated that he had given orders for an investigation to be made into the capsizing of the TIRPITZ. It was thought that, contrary to orders and reports, TIRPITZ had not been anchored sufficiently securely. The authorities consulted in this investigation were those who had been responsible for the selection of the berth for the TIRPITZ. They were:-

Rear-Admiral Peters, former Flag Officer, 1st Battle Group
Captain Junge, commanding officer of TIRPITZ
Vice-Admiral Nordmann, F.O.I.C., Polar Coast
Captain Krüger, Sea Defence Commandant, Tromsø

The reports submitted by these officers on the capsizing of TIRPITZ are given below.

Rear Admiral Peter's report (16.11.1944)

4.2 The soundings taken after the transfer of TIRPITZ to her new berth were - as far as can be remembered - about 2 m. at the bow and stern, amidships about 5 to 6 m. (16.6 to 20 feet) depth below keel at low water; according to the calculations of the TIRPITZ officers, it was thought possible that, taking into consideration the circumstances of the previous bomb-hits, the ship might take on a heavy list, but could not capsize.

4.3 The mooring buoys were shifted at that time on instructions from Admiral Polar Coast, actively assisted by the TIRPITZ navigation officer. The relatively great depth below the middle of the ship was undesirable. There were two possibilities of remedying this disadvantage:-

- (a) by shifting the mooring buoys to the south into more shallow water
- (b) by filling in the deep hollow underneath the midship section with the help of a dredger

The then F.O. (Cruisers), in an address to OB MOK, Chef Skl., and Ob. d. M., had expressed his preference for the latter, as, by this means, if necessary, a more symmetrical placing of the ship could be attained.

4.4 Reasons for the capsizing cannot be assessed here without a fuller knowledge of the type, extent and effect of the hits, if the ship - as announced in British reports - sustained at least three direct hits, in the bow, amidships and in the stern, from very heavy bombs, and also two near misses in close proximity, causing devastation within the ship's hull and disturbance of the soft sand of the sea-bottom. (Crater on 15.9.44 on shore about 30 m. (approx. 100 feet) diameter, 8 m. (26.5 feet) in depth). It therefore appears possible, in my opinion, that either the midship section did not meet sufficient resistance in the sea-bottom when the ship began to list, causing the inertia moment to increase and the ship to capsize, or that as a result of the breaking of the cables (two cables were broken on 15/9 - of.), the ship had slipped into deeper water.

4.5 The above-mentioned details are surmise based on the prevailing circumstances at the time I left (20.10.44). They do not refer to the alterations, experiences or new decisions, which may have occurred in the meantime.

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Captain Junge's report (15.11.44)

4.6 At the conference in TROMSØ on the 28th - 30th September (Admiral Nordmann, Admiral Peters, Captain Junge), the area of TROMSØ seemed particularly suitable and was referred to higher authorities for decision, because according to the charts available, a suitable anchorage of an almost constant depth of $5\frac{1}{2}$ fathoms at low spring tides was to be found south of Hakby, and many other aspects favoured this place. The requirement of $5\frac{1}{2}$ fathoms came from me as the result of previous conferences on board.

4.7 I, as Captain, took no part in the arrangements for the berth, because of a decision by S.O. Cruisers. I had unfortunately put my Navigation Officer (also Unit Navigation Officer) Korv. Kap. Brutzer, at the disposal of Admiral Polar Coast in TROMSØ for consultation and to represent the interests of the ship, in particular with the laying of buoys for the passage through Sande Sound. When choosing the berth, the question of the arc of fire came into the foreground, as well as safeguards against sinking or capsizing. At a short conference on board at the beginning of October, Captain Brutzer reported to me that a suitable berth was to be found at the suggested place, which, with the ship laying in approximately an East-West direction, would enable all guns to be brought to bear on the main lines of fire.

4.8 Before the transfer of the ship proposed by S.O. Cruisers for the 15th of October, Captain Brutzer returned from TROMSØ on the afternoon of the 14th, with the report, which was a surprise to me, that, taking into consideration the desired arc of fire in the chosen berth, exact soundings showed that the disadvantage of a depth of water of more than $8\frac{1}{2}$ fathoms directly beneath the greater part of the ship must be accepted. A suitable berth with nearly $5\frac{1}{2}$ - 6 fathoms of water was to be had much nearer the island of Hakby with an approximately North-Easterly direction. However, this would mean that the main line of fire (Groetsund) allowed only the forward gun turrets to be used. The safeguards against sinking or capsizing seemed to me to be very questionable. Because this new position might be decisive in choosing a berth, I immediately informed S.O. Cruisers, through Captain Brutzer, and ordered the Engineer to go into the safety questions in the berth previously decided upon. The rough calculation showed that the prevailing depth of water would not give complete security against capsizing, but that safety was likely. I also informed S.O. Cruisers of this, on the evening of the 14th. He decided to move the ship as arranged on the 15th, and to carry out more exact investigations, and eventual modifications, in TROMSØ.

4.9 Immediately the ship had made fast at the new berth, the water around her was sounded again minutely. The unfavourable contour was confirmed. Apart from this, it was established that improvement was not to be had by altering the length of the hawser in the berth.

4.10 In this situation, it seemed best to obtain the desired depth under the ship by filling up the deeper places using dredgers. This was easier and quicker to achieve than arranging a new berth, facilities for which were not available at the time. The dredger was demanded from the department on the spot. The Material required to be shifted was estimated by experts to be about 30,000 metres, for which about a week would be needed. After some preparatory work (testing the sea-bed, etc.,) the first dredging took place on the 2nd or 3rd November. I cannot give details of the further progress of the work following my departure on the 4th.

4.11 As a reason for the ship capsizing, apart from the depth of water, I suspect the soft nature of the sea bed, which possibly did not give the ship sufficient support on touching the bottom. An event of the 29th October strengthens my suspicion of this. After this attack, a tug came alongside

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abreast the near-hit on the portside aft, and her captain reported touching the ground at one point, where before there had been at least 6 - 7½ fathoms of water. The proposed soundings of this suspected rise of the sea bed as the result of the explosion had to be postponed about 2 days because of more urgent work, and when carried out, did not confirm the displacement of the sea bed. I suggest that the hump was smoothed out by the action of the tides.

Vice-Admiral Nordmann's report (17.11.1944)

4.12 Berth selected after investigations made in agreement with Admiral in Command, S.O. 1st Battle Unit, and Captain of the ship, having regard to shallow water and safety measures. Thereafter soundings by Hooze under the direction of the ship's Navigation Officer. Result:-

No uniformly level berth. In first position planned, ship lay north and south along a deeper channel; hence it was decided with S.O. Cruisers to put the ship east and west, which left a hollow of 45 feet under the middle of the ship. Corresponding laying of buoys under Navigation Officer. When berthing, the ship did not take up the exact position proposed, therefore hollow was now 51 feet. Filling up the hollow by means of dredgers was undertaken at once. The possibility of the ship capsizing because of the hollow, was not considered likely, but rather that she might settle after being hit, causing a strain on the longitudinal frames and displacement of the supporting frames (horizontal) of the big guns, thereby putting them out of action. Danger of capsizing in shallow water was considered to exist here unless the ship sank slowly, with a moderate inrush of water covering a period of at least 20 minutes; so that, after touching the bottom with a heavy list, the ship would have time to right herself. In the event, however, there was not 11 minutes between the bomb-hit and the sinking. Such forces are unpredictable. It is not impossible that the ship jumped several yards. Thus, even if she had been in the shallowest water, there would have been no absolute security against a capsizing, especially for a few hours round each high tide. (MRS 26 capsized, although she was resting on the bottom). Then there is the changing draught of the ship due to fuel and water carried.

Captain Kruger's report (17.11.1944)

4.13 Eye-witness accounts reveal that the portside outer hull was ripped open by a direct hit and several near misses. This caused heavy inrush of water. The Captain's order for the counter-flooding could not be carried out. As the result of the explosion when the ship heeled over 60 - 70 degrees, 'C' turret shifted 20-25 metres from its mounting. - Confirmed by divers. This immediately caused heavier inrush of water and further rapid heeling over of the ship, resistance to further heeling over was small, so that, in spite of the bilge keel, which broke off, the ship finally turned over.

4.14 As a consequence of earlier hits on 29.10, the stability of the ship had been reduced because of single compartments that had been flooded. At the beginning of the attack the ship had a 1 degree list to port.

4.15 The following is an extract from a letter dated 27th January, 1945, addressed to the German Naval War Staff from the Shipbuilding Section of the German Navy:-

"According to the address given on 24th January, 1945, by Lieutenant (E) Bernstein, the sea-bottom at the place where the battle-cruiser TIRPITZ capsized does not consist, as previously accepted from reports on the subject, of rock, but of about 1 m. depth of sand and underneath that 5 to 6 m. of mud."

"Up to the present the capsizing of the vessel appeared to be in contradiction to the previous statement that the ship, lying on firm ground and with 3.5 m. water below keel at the time of the attack, could not have capsized. As a result of the different constitution of the sea-bottom, this contradiction is clarified and an obvious cause for the capsizing is revealed".

The results of the investigation were stated as follows:-

"It is definitely made clear that the actual depth of the prepared berth did not conform to the requirements and directions of the Commander-in-Chief, as had been reported to the Commander-in-Chief and to the Führer".

14.11 Survey of wreck

See Appendix B (Volume 1).

