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COMMANDER-IN-CHIEF FLEET

**LOSS OF HMS SHEFFIELD
BOARD OF INQUIRY**

**Main
Annex A and B**

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See Distribution

28 May 82

LOSS OF HMS SHEFFIELD - BOARD OF INQUIRY

1. You are to assemble in HMS NELSON at 0900 on Monday 7 June 1982 as a board of inquiry whereof (XXXXXXXXXXXXXXXXXXXX), Royal Navy, is to be the President and hold a full and careful investigation into the circumstances leading to and attending the disablement and later sinking of HMS SHEFFIELD under the Command of Captain J F T G SALT, Royal Navy, between 3 and 11 May 1982, calling before you such witnesses as are necessary and reasonably available to enable you to form correct conclusions.
2. Specifically you should ascertain and identify by questioning those involved and other available witnesses the matters listed in Annex A. Although the matters in Annex A are significant, they are not intended to be exhaustive and all other areas of inquiry deemed pertinent should be scrutinized.
3. The Commanding Officer, HMS SHEFFIELD's preliminary report is at Annex B.
4. Should any information come to light which the President considers should be communicated urgently to me or to any member of my staff, such information is to be sent by any appropriate manner in anticipation of completion of the inquiry.
5. A list of those on board HMS SHEFFIELD on 4 May 1982 is at Annex C.
6. The inquiry is to be conducted in accordance with the directions contained in QRN Chapter 23, Appendix 38, and FLAGO 1619.
7. The report of the board is to be accompanied by minutes of evidence, or statements taken, and is to contain an expression of opinion on the degree of adequacy of personnel, material and procedures.
8. The report is to be signed by each member of the board and is to be forwarded in original and unstapled form. The President is to deliver his report personally and brief me on the principle findings.
9. Shorthand writers will be detailed from the offices of the Commander-in-Chief Fleet, Flag Officer Plymouth and Flag Officer Portsmouth.

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Annexes:

- A. Specimen Matters for Investigation.
- B. The Commanding Officer HMS SHEFFIELD's Report dated 26 May 82.
- C. List of personnel on board HMS SHEFFIELD on 4 May 82.

Distribution:

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SPECIMEN MATTERS FOR INVESTIGATION

Operational

1. The Task Group Commander's assessment of the threat before the attack.
2. The Task Group Commander's intentions and policies in force at the time of the attack.
3. The Task Group communications plan before the attack.
4. The disposition of the Task Group.
5. The degree of readiness of the Task Group, and the ship, before, during, and after the attack.
6. The ships OPDEF state immediately before the attack.
7. The manning states of operations teams, weapons, propulsion and generation systems, and the locations of personnel.
8. The damage control state and condition immediately before, and at the time of, the attack.
9. The nature and sequence of events before, during and after the attack.
10. The use of countermeasures, including chaff, against the attack.
11. Whether, and how, the ship's weapon systems and sensors were used.

Design/Maintenance

12. The adequacy of the Type 42's weapon and sensor fit and its ability to react to the threat.
13. The adequacy of the damage control and fire fighting organization, procedures, equipment and training.
14. Any problems arising from the design and layout of Type 42 destroyers and their machinery and equipment, with particular regard to any hazardous materials.
15. The degree of readiness of, and confidence in, all weapons, sensors and communication equipments, including the degree to which standard operator checks and performance servicing logs were used.
16. Any shortcomings in machinery operating procedures.
17. The influence, if any, of the material state of the ship on events.

Environmental

18. The environmental conditions and observed effect on air picture compilation.
19. Any evidence of stress affecting the ship's company before the attack.

20. Any evidence of efficiency being reduced because of seasickness, shortage of sleep, or length of time closed up at action and defence stations, or any other cause.

Training

21. The adequacy or otherwise of individual training and preparation of personnel.

22. The adequacy or otherwise of whole-ship training and preparation of personnel.

Administrative/Medical

23. Whether those trained in First Aid were adequate in numbers and in expertise.

24. Whether First Aid parties were closed up.

25. Whether access to the Sick Bay and First Aid stations was affected by damage.

26. Whether any casualties were treated.

27. Whether any clinical diagnoses of causes of death were established.

28. Whether man-made fibres rather than cotton were worn by personnel, and whether these fibres contributed to burns.

29. Any evidence of toxic fumes arising from electrical cable insulation, plastics, cushions, etc.

30. Any evidence to assist towards the registration of deaths, and towards giving further information to next-of-kin, such as - where each fatal casualty was last seen, his apparent physical condition at that time, and known or conjectured cause and circumstances of death.

Rescue and Salvage

31. Brief narrative of immediate rescue assistance by other ships to HMS SHEFFIELD and her personnel.

32. Brief narrative of taking in tow, and eventual sinking.

33. Summary of equipment, materials, etc salvaged from the ship before she sank.

HMS NELSON
Portsmouth

Commander-in-Chief Fleet
Eastbury Park
Northwood
Middlesex
HA6 3HP

22 July 1982

Sir

1. We have the honour to report that, in accordance with your instructions dated 28 May 82, we have conducted an investigation into the circumstances leading to and attending the disablement, and later sinking, of HMS SHEFFIELD under the command of Captain J F T G SALT, Royal Navy. Our report is attached. Our conclusions and recommendations are at Annexes A and B respectively. Summarised main conclusions and recommendations fall at the end of this covering letter. Our report is generally chronological but is also divided thematically, the principal sections covering Operations, Damage Control and Fire Fighting, Medical and Salvage.

2. A preliminary investigation was carried out by Ship's Officers. Although the Board does not agree with all the conclusions or the analysis leading to them, we found it most helpful.

3. The Board sat in HMS NELSON and was provided with all necessary facilities. Witnesses were called from HM Ships SHEFFIELD, GLASGOW and COVENTRY, together with expert witnesses on ship stability, ventilation, materials, GWS 30 drill and the EXOCET missile. CTG's views were signalled to us. Evidence was taken at Fleet Headquarters and RNE HASLAR.

Situation

4. On Saturday 1 May, the Task Group (TG) commenced operations in the Total Exclusion Zone (TEZ). On that first day SHEFFIELD went to Action Stations and State 1, Condition ZULU on numerous occasions at Air Warning YELLOW. However, because radar detection ranges on Argentinian aircraft of some 160 miles were being achieved, and because attacks were made only on the NGS Group inshore, the routine was subsequently modified and Action Stations were delayed until Air Warning RED. SHEFFIELD and others were dogged by what they considered to be ESM induced false alarms, believing that Mirage III radar was being wrongly identified as the AGAVE radar (nicknamed CONDOR) of the Argentinian SUPER STANDARD (SUPER E). The 2 and 3 May were quiet and the ship settled into a Defence Watch routine. The Air Warning remained YELLOW throughout.

5. CTG and TG ships had been provided with a large amount of intelligence data. On the crucial question of whether Argentinian SUPER Es had Air-to-Air Refuelling and EXOCET (AM 39) capabilities, and hence whether ships were liable to AM 39 attack on 4 May, CTG and SHEFFIELD had much the same information, showing that such an attack was quite possible. However, SHEFFIELD rated the AM 39 danger lower, and the submarine threat higher, than did CTG.

The Attack

6. At the time of the attack, on the afternoon of 4 May, SHEFFIELD was the southerly of three Type 42 destroyers disposed on an Air Defence Screen about 18 miles to the West, up threat, from the main body. The AAWC was in INVINCIBLE and Flag in HERMES. The weather was fair and cool with a calm sea and 2m swell. The ship was in Defence Watches and Damage Control State 2, Condition YANKEE. An overt policy was in force and SHEFFIELD was transmitting on radar, sonar, HF, UHF and SHF.
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7. The raid was first detected on UAA1 by GLASGOW XXXXXXXXXXXXXXXXXXXX
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subsequently gained two 965 contacts at about 40 miles. GLASGOW reported
the raid on AAWC HF and AAWC UHF, released it to LINK 10, reporting
"ONEY", and called the racket as "CONDOR 245". GLASGOW went to Action
Stations and fired Chaff D. Paints had been seen in INVINCIBLE at 50
and 30 miles which correlated with GLASGOW's CONDOR report. CAP were
told to investigate but found nothing. The AAWC did not accept GLASGOW's
classification of the raid and declared the contacts to be spurious.
ZIFFO 4 was not called by the AAWC and Air Warning remained YELLOW.

324

8. At about 15 miles the two attacking SUPER Es swung to starboard away
from GLASGOW and towards SHEFFIELD. In SHEFFIELD, UAA1 XXXXXXXXXXXXXXX
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XXXXX Chaff was not fired. XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
The raid was not engaged. The ship remained at Defence Stations and in
Damage Control State 2, Condition YANKEE. XXXXXXXXXXXXXXXXXXXXXXX
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9. One missile struck the ship at 2 Deck starboard between the Galley
and the Forward Auxiliary Machinery Room, (FAMR) and Forward Engine Room,
(FER). A possible second missile missed and ditched close by. The
Argentinian launch aircraft flew down ship's head, perhaps to observe
the results of the attack. XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
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Damage Control and Fire Fighting

10. The missile's impact left a 15 feet by 4 feet hole in the ship's
side and caused widespread minor shock damage, typically the buckling of
doors and collapse of ladders. Evidence indicates that the Warhead did
not detonate. There are few reports of shrapnel. Large fires broke out

Recommendations.

30. General. Training and doctrine for defence against sea skimming missiles must highlight the supreme importance of vigilance, and of instant, full reactions on first indication of possible attack.

31. In relation to Type 42 Destroyers

- a. Improvements in self defensive capability against the sea skimmer are urgently required.
- b. Arrangements for maintenance or restoration of firemain pressure following extensive damage are essential.
- c. Methods of preserving the ability to control and fight the ship in dense smoke should be investigated.

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e. Smoke clearance arrangements require review.

We have the honour to be,
Sir,
Your obedient Servants

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ANNEXES:

- A. Conclusions
- B. Recommendations
- C. Ship's History and Equipment Fit
- D. CORPORATE Deployment to TBZ
- E. NBCD and Air Defence Training Achieved
- F. OPDEPs and Defects
- G. Intelligence Assessments
- H. Narrative of Attack
- J. Analysis of Attack and Response
- K. Post Attack Narrative
- L. Post Attack Analysis
- N. Fire and Materials
- N. Salvage Phase - Narrative
- P. Salvage Phase - Analysis
- Q. Casualties
- R. Analysis of Casualties, First Aid and Medical Factors
- S. CTG Lessons Learnt
- T. List of Witnesses
- U. Minutes of Evidence (Separate from Report, in three boxes)
- V. CINCPLEET's Directive
- W. HMS SHEFFIELD Report (Separate from Report, in 13 volumes)

48. In both firefighting and subsequent salvage attempts we consider the (XXXXXXXXXXXXXXXXXXXXX Royal Navy, displayed considerable personal bravery and professional competence.

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RECOMMENDATIONS

ANNEX A

The principal recommendations of the Board are:-

1. In defence against the sea skimming missile, training and doctrine must stress heavily the importance of:-
 - a. Constant vigilance by all on watch. 7, 8, 1
 - b. Not degrading own sensors, eg, XXXXXXXXXXXXXXXXXXXXXXXX
XXXXXX? 8
 - c. Instant, full reaction, in accordance with standard tactical doctrine and teaching, on first indication of possible attack. 9, 10,
 - d. The supreme importance of timely firing of Chaff, particularly Chaff D. 9, 14
 - e. Speedy 909 acquisition, even for the very difficult fast low flyer. 10
2. Improvement of the Type 42's self defensive capability against the sea skimming missile is required urgently. Areas for consideration include provision of a Jammer and a Point Defence System. 16
3. Efforts to simplify, shorten and improve 909 acquisition procedures, particularly for low targets, should be given high priority. 16
4. The provision of a realistic 909 acquisition simulator be investigated. 16
5. Smoke clearance arrangements in Type 42 Destroyers be reviewed. 18, 19
6. Methods of preserving the ability to control and fight the ship, even in heavy smoke, be investigated. 18, 19,
7. Facilities to permit escape through smoke filled areas be provided. 3, 17, 2
8. The revised advice to isolate Firemain at Action Stations be confirmed. 21
9. Early consideration be given to the arrangements for maintenance or restoration of Firemain pressure following extensive damage. 21
10. XX
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11. Urgent steps be taken to improve the performance and reliability of Rover Gds Turbine Pumps, or a replacement be provided. 28

12. The susceptibility of all Type 42 equipment to shock damage be tested and remedial action taken where necessary.

21, 29

13. Efforts to reduce the flammability and toxicity of furnishings and other materials should be continued.

17, 30, 33

14. All classified material held on board SHEFFIELD, except that known to have been removed, be written off.

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MINISTRY OF DEFENCE

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From: XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

S38
SVC
DAA

Ref: D/NLG/1/9/78/1 —

Commander in Chief Fleet
Northwood
Middlesex
HA6 3HP

8 December 1982

Sir

BOARD OF INQUIRY - REPORT INTO THE LOSS OF HMS SHEPFIELD

Reference: 520/237L dated 13 September 1982

1. I am commanded by the Admiralty Board of the Defence Council to inform you that they have taken note of your report and the Board of Inquiry proceedings forwarded under the reference.
2. The Admiralty Board made the following observations:-
 - a. The up-dating and enhancement of the Type 42 weapon fit including the fitting of a close-in weapon system, is being urgently studied. Progress will depend in part on the availability of dockyard capacity, the requirements for which are being reassessed in the light of changes in the Surface Fleet since Cmd 8288 was published.
 - b. Action is also in hand to remedy other equipment deficiencies reported.
 - c. The factors that contributed to the rapid spread of black toxic smoke have been examined, taking account of the report of a special team from the Marine Technology Board. It has been concluded that in this particular incident the contribution from inflammable cabling, linings and furnishings was not critical having regard to the major effects of the missile break-up and the rupturing of the Dieso fuel tank. Nevertheless it is agreed

/ that the ...

that the questions of habitability and damage control need closer investigation. These and other important lessons are now being incorporated in the latest design work on the Type 23 frigate. So far as possible remedial action will also be taken in existing ships and ships building. When assessing the priorities for expenditure, however, a balance may have to be struck between measures designed to improve survivability in the event of a hit and measures designed to prevent a hit in the first place.

d. Following trials of AEW-fitted helicopters in HMS ILLUSTRIOUS plans are being developed to provide a capability with converted Sea Kings for each operational CVS.

e. The importance of matching Commanding Officers and Executive Officers to appointments relevant to their experience is fully agreed, and measures to achieve this are being examined.

3. Your Report and the Proceedings have been taken into account in the "Lessons Learned" studies in the Navy Department. The detailed lessons in your Report and the Proceedings are being followed up by the staffs responsible. The Admiralty Board may wish to make further observations when all the lessons from Operation CORPORATE and in the Reports and Boards of Inquiry into the other ship losses have been fully examined.

I am, Sir,
Your obedient Servant

Handwritten initials

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COMMENTS ON ACTION REQUIRED OR TAKEN IN RESPECT OF HMA BOARD
OF INQUIRY REPORT

1. Each of the recommendations in Annex B of the Board of Inquiry Report requires action. Comments on some of these recommendations are as follows.
2. The need for 'layered' air defence is emphasized. Medium-range SAM must be supplemented by close-range systems; a Point Defence Missile System and close-range gun armament, both independent from any of the Sea Dart control arrangements, would be complementary to each other in this task. (MOD action required).
3. The need for defensive capability, in all types of ship, against the sea-skimming missile has already been stated in CTF 317's "Equipment Lessons Learned" report. (CINCFLEET's 210/1/38.W (Revised) dated 15 July 82 to MOD(DCS)).
4. The provision of adequate simulation for 909 Low Target acquisition practice is urgently required. (MOD action required).
5. An investigation is required into the effectiveness of resilient mounts on WE equipment. (MOD action).
6. Although the unused missile propellant was a major producer of smoke there is evidence that significant quantities of noxious and toxic fumes were generated from furnishings and other combustible materials. The conclusion as a result of this experience that desirable improvements in habitability have been made at the expense of essential fire prevention and damage control characteristics is strongly supported. Annex B to this letter also refers. (MOD action required).
7. Only backed or bonded Formica panelling should be left in situ. HMS GLAMORGAN's experience when hit by an Exocet missile on 12 June was that unbacked Formica panelling shattered into razor-sharp fragments from blast and impact, causing several injuries, some serious. This matter is being studied by my staff, but investigation by MOD also is indicated. (Page D-2 para 5 refers).
8. The need for training to operate in conditions of smoke underlines the problem of the current shortage of smoke generators for this purpose. (MOD action required).
9. Although some action has already taken place on the critical Damage Control and firefighting equipment deficiencies listed in the recommendations (Annex B) and in Annex L, investigation and remedial action should continue to be pursued with vigour. (MOD action needed).
10. Action should be taken to enforce a mandatory firefighting PJT for all ranks/rates at present an average of 40% achieve it. This requires action by Naval Secretary in the case of officers, and by the previous establishments in the case of ratings (in most cases this will be within the purview of CINCPACFLT).
11. MOD(DNSY) and the Cabinet Office have been requested (CINCFLEET's 190/0/29.X(a) dated 4 Aug 82) to take the necessary action to write off the classified material held on board. (Page B-2 para 14 refers).

ACTION WITHIN CINCFLEET'S RESPONSIBILITY

12. Completed Action. The following actions have already been completed:
 - a. ADAMS 4 Edition 30 Software has reduced 909 acquisition times (XXXX
XXX)

b. Degradation of UAA 1 by SCOT transmissions has been reduced significantly by the fitting of filters in UAA1.

c. The practice of operating the firemain de-isolated at action stations arose from a view that this provided maximum back-up for magazine sprays. The SHEFFIELD experience showed that this policy, while providing security against a threat in peacetime which was likely to be internally generated (eg a fire), is inappropriate in action with an external threat. The relevant instruction was changed immediately after the attack on SHEFFIELD. (Page B-1 para 8 refers).

13. Current and Future Action. Current and future action by my staff includes:

a. Trials of an immediate Sea Dart engagement sequence for close-range targets, requiring only a single action by the Missile Gun Director, are currently in progress in HMS NEWCASTLE, as part of a new ADAMS 4 issue.

b. The Marine Engineering recommendations arising from the report are directly within CINCFLEET's area of responsibility, although many are the subject of liaison and follow-up actions with departments concerned.

c. General lessons from this and other boards of inquiry will be included in a compendium report circulated to Flag and Commanding Officers and appropriate training establishments.

d. The specific subject of training and doctrine for defence against sea-skimming missiles will be accentuated in the revision of FOTI O702, currently being undertaken by my Staff and the Maritime Tactical School.

e. Morphine should be distributed to members of the ship's company in accordance with BR 2170 Volume 2 Chapter 36. Medical Officers in Fleet are being reminded of this requirement. (Page B-1 para 3 refers).