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CABINET

A DEFENCE SUPPRESSION WEAPON FOR THE ROYAL AIR FORCE

Note by the Secretary of the Cabinet

1. At a meeting of the Ministerial Committee on Defence and Oversea Policy (OD) on 30 June 1983, I was instructed to prepare a note of the facts and issues on the choice of a defence suppression weapon for the Royal Air Force, to be agreed so far as possible with the Departments concerned and to state differences of view where those needed to be exposed, which would serve as a basis for a discussion by the Cabinet.

2. A note has been prepared accordingly, and the Prime Minister has instructed me to circulate it herewith for consideration by the Cabinet.

Signed ROBERT ARMSTRONG

Cabinet Office

13 July 1983

A DEFENCE SUPPRESSION WEAPON FOR THE ROYAL AIR FORCE

Note by Officials

Requirement

The Royal Air Force have a requirement for a missile capable of suppressing the radars and electronic components of missile defences. Without such a missile the new Tornado aircraft, which from 1985 will be equipped with the airfield attack weapon JP233, will be unable to penetrate the air defences which the Warsaw Pact is expected to deploy without suffering very high attrition rates.

2. The requirement is for 750 missiles, possibly increasing to over 1,000 if funds are available.

3. The United States also plans to deploy aircraft equipped with modern defence suppression weapons. Other NATO countries have expressed interest in such weapons, but none has yet taken a decision.

Options

4. The choice is between two missiles -

a. HARM is a missile already developed in the United States which will be produced for the US Forces by Texas Instruments. Proposals have been made under which an element of final development and a substantial part of production to meet a British order would be carried out in the United Kingdom by British firms under the leadership of Lucas Aerospace, though the high technology homing head would be supplied entirely from the United States. The cost of 750 missiles would be £254m (all figures in 1982/83 prices); of this 53% would be on a fixed price basis, and the final price paid for the remaining 47% would be the same as the US Forces would pay. The cost for 1,000 missiles would be £309m. These estimates assume an exchange rate of £1 - $1.59. Under the original offer which assumed a firm order being placed by 1 April 1983, sufficient missiles for an initial operational capability could have been delivered by September

1986 - the In Service Date (ISD) - wit the full 750 order being completed by January 1991. Texas Instruments have advised that these dates now have to be slipped in step with the delay in signing the contract, which would mean an ISD of January 1987. It would be possible to purchase HARM entirely from the United States at a slightly lower cost, estimated at £235m for 750 missiles or £292m for 1,000 missiles, though with a fixed price element of only 10%; but since the cost saving would be small and there would be no involvement of British industry, this option is not considered further.

b. ALARM is a missile which would be developed by British Aerospace Dynamics in conjunction with Marconi Space and Defence Systems (part of GEC), Thorn-EMI and other firms. Some early development work has been done at both the firms' and Government expense and British Aerospace have offered a fixed price development and production contract at a total cost of £388m for 750 missiles and £426m for 1,000 missiles. The contract would provide for the first 100 missiles to be delivered by August 1987 and for deliveries to be complete by September 1989. Failure to deliver the first 100 missiles on time would render British Aerospace liable to liquidated damages of up to £0.5m (a similar premium would be payable by the Ministry of Defence for early delivery).

Uncertainties

5. The choice of missile is complicated by a number of uncertainties. These affect delivery and operational capability, final cost and export potential.

6. Sharing the order between HARM and ALARM would be the most expensive course of all, and we have not considered it further in this paper.

Delivery and Operational Capability

7. The Americans have demonstrated that HARM works, but the missile will not necessarily be capable of dealing with improvements in Warsaw pact defences in the 1990s without itself being improved. ALARM is as yet undeveloped, but the concept is more advanced than HARM: it incorporates the latest technology, particularly in software, and would therefore be more

readily capable of being enhanced to deal with improvements in Warsaw Pact defences in the 1990s (although there must also be some uncertainty as to how the threat develops and what will be needed to meet it). We should be able to develop it to meet our own requirements and should not be dependent on improvements which the Americans might decide to introduce in HARM.

8. But there must be a question mark over the ability of British Aerospace and its sub-contractors to develop ALARM to an acceptable standard in the four years which they have allowed. Past experience of weapon developments, both in the United Kingdom and the United States, suggest that a six-year development programme would be more realistic. The contractor's development plan is based on optimistic assumptions and allows virtually no time for the solution of any serious problems that arise. There is a risk of some slippage in deliveries. This has to be weighed against the financial incentive on the firms to deliver on time and the need to supply the RAF with an operationally fully acceptable weapon. If nevertheless delays occurred and the RAF had to face a conflict without an adequate weapon, it would take between 6 and 12 months, assuming full US co-operation, to adapt the RAF Tornado to operate HARM.

9. On <u>final cost</u> the ALARM programme on the face of it has a greater degree of certainty than HARM, since 97% of the work would be on a fixed price basis subject only to increases due to inflation. As is usual under such arrangements, it is the contractor who would be liable for all increases in cost caused by delays or failures on his part to meet the agreed programme; this could cost him up to £3m for every month overrun. British Aerospace could be expected to exploit every opportunity to overturn the fixed price contract, but the Ministry of Defence would be obliged to meet additional costs if, and only if, delays arose from Government failure to provide trials or other facilities. If the total number of missiles ordered by the RAF were increased, the cost differential would fall: for example, if 2,000 missiles were bought the extra cost of ALARM over HARM would fall from £134m to £70m.

10. The final price of HARM is not within our control, since we should have to pay the same price for the seeker head, which would be manufactured in the United States, as would be paid by the United States Forces themselves. The cost could therefore increase if improvements were introduced to meet the requirements of the US Forces, or be reduced if the US Department of Defence secure savings in the price. The cost differential between HARM and ALARM is also subject to fluctuations in the real exchange rate of the £ against the dollar. For a 5 per cent change in the rate the cost differential on 750 missiles would change by about £10m.

11. Export prospects are also unclear. If the UK purchased HARM, Lucas would have an excellent opportunity to export the components which they would be making in Britain to the United States for incorporation in missiles which would be assembled there for delivery to US Forces and to export customers for HARM. They would have the right to compete with US suppliers for US domestic and export sales expected to total 25,000 missiles. Their share of the work, providing they were competitive, has been estimated at about 10 per cent, equivalent to 1,550 missiles. Prospects for exports of ALARM are uncertain. HARM will be a powerful rival, particularly for those countries who already have United States aircraft and missiles: and the UK's past success rate in selling British weaponry against direct US competition is not encouraging. The Ministry of Defence believe that British Aerospace could at best hope to win some 25-30 per cent of the third country market, ie some 1,250-1,500 missiles. The Treasury judge it more likely that there would be no export business for ALARM, particularly if it proves to be uncompetitive on time and price.

Technological factors

12. The development of ALARM would be one way to retain in the United Kingdom a capability in homing-head technology. Marconi is the only British firm with this capability. They have successfully developed a number of missiles and are at present engaged in completing the homing-head for the airborne anti-ship missile Sea Eagle. The ALARM programme would provide continuity and keep the present development team together.

13. Homing-head technology will be of great and increasing importance in modern weapon systems as the emphasis switches to "fire and forget" missiles. Their value was demonstrated in the Falklands conflict (Exocet is such a missile) but will be even more vital in the sophisticated electronic environment in which NATO would have to fight any future battle against the Warsaw Pact.

14. There is no real risk in the foreseeable future that the United States will either cease developing weapons of this sort or would refuse to supply them to a major NATO ally such as the United Kingdom. The Ministry of Defence nevertheless judge it essential on defence grounds to retain in this country a homing-head and guided missile technological base. Moreover, if British industry loses such a capability it will become progressively less able to compete in the market for modern weapon systems both for our own forces and for export.

15. The Ministry of Defence considers that much the most effective way to maintain this capability would be to develop and manufacture ALARM. No other programme using anti-radar technology is ready to go into development: in the absence, therefore, of an order for ALARM the expertise in British industry would be endangered and perhaps lost. The Treasury, on the other hand, believe that it would be possible to preserve the capability in British industry for relatively modest expenditure, much less than the extra cost of ALARM over HARM, by bringing forward national work on other future missile projects and by financing a supporting programme in key aspects of missile technology. The Department of Trade and Industry consider that a decision in favour of ALARM would be an excellent example of a public purchaser supporting important technology and would be consistent with the Government's policy of buying British when British industry is competitive in terms of price, performance and technology.

16. Another possibility would be to seek British participation in an American programme to develop an improved homing-head for HARM. But prospects are highly uncertain. Much depends on the nature and timing of the improvements which the US Forces will want. We cannot therefore know whether the programme could provide development work for which Marconi would be suitable. There could be technical problems in integrating a British homing-

head into an American missile, particularly as there would probably be commercial and political obstances to overcome in this highly competitive and sensitive area of defence technology. In order to protect their technology, the US Government have already stipulated that we may only have the existing HARM homing-head through Government channels and that we would have to return it to the United States for repair. The judgement of HM Embassy in Washington is that the chances of Marconi attaining any significant share in an American homing-head development programme are doubtful.

Industrial considerations

17. The ALARM programme would generate some 9,400 man years of work over 7 years in British industry. The employment would be mainly in the London area, the South of England and Lancashire. HARM would generate some 3,500 man years of work over 8 years, mainly in Lancashire and the West Midlands. In both cases, the value of export potential in job terms is assessed as about 5,000 man years, but the calculation is difficult and cannot be stated with any great precision. In the context purely of employment considerations, the Treasury point out that, leaving aside the uncertain export prospects, each additional man-year bought by purchasing ALARM would cost approximately £25,000 (about 10 times the cost per man-year of the Government's special employment measures).

18. The Treasury also point out that the saving of £134m if HARM were preferred to ALARM would remain available to the defence budget for purchases of other defence equipment, and orders could be expected to go primarily to British industry (over 90 per cent of defence procurement is placed in the UK).

Budgetary considerations

19. On the basis of present estimates the ALARM programme would cost £134m more than HARM, a margin of some 55 per cent. The extra cost of ALARM falls primarily in the PES years 1984-85 to 1986-87. To accommodate the extra costs would require programme changes in other areas. Nevertheless, on the basis of the Government's existing commitment to 3 per cent growth in defence expenditure up to and including 1985-86, the Ministry of Defence believe that they can absorb the extra costs, amounting to £40m a year, without substantial detriment to the rest of the programme.

International aspects

20. We have argued firmly with the Americans - in pursuit of a better balance of trade in defence equipment between the UK and the US - that each side should be willing to buy from the other when a competitive product exists, on which research and development has been completed, and which meets the military requirement. Our efforts have had considerable success. Since 1975 defence sales to the US have doubled in real value and the adverse trade imbalance has improved from 3.1:1 in 1976 and 4.4:1 in 1978 to 1.5:1 in 1980 and about 2:1 in 1982 (this contrasts with a balance between the US and Europe of about 8:1). Notable successes during that period have been the sale of Rapier (£153m), combat support boats (£20m), medium girder bridge (£70m), head-up displays for combat aircraft (£113m), ship stabilisers (£16m), AV8B (the British Aerospace/McDonnell Douglas development of the Harrier - at least £500m). There are good prospects of maintaining the balance at current levels at least over the next 2 years or so.

21. In these circumstances a decision not to buy HARM, which is known to be available soon and more cheaply and to be operationally acceptable, could expose us to criticism in the United States and could undermine the efforts which our friends in the Administration and Congress have been making to secure a change in American attitudes to purchases of defence equipment from Britain. Our Embassy in Washington advise that a decision to buy ALARM would undercut the arguments we have been using with the Administration and with Congress and would not be understood even by those in the Department of Defense who are sympathetic to our cause.

22. A decision to purchase HARM would not of course guarantee favourable treatment for other prospective sales of UK defence equipment to the US; the protectionist tides in Congress are strong. But for this very reason a decision in favour of ALARM despite its higher cost could have a negative impact on our prospects elsewhere. The possibility of retaliation against other British sales interests - by Congress, if not by the Administration - cannot be ruled out, although explicit linkage between this decision and specific UK sales is perhaps unlikely. Prospective British sales to the US include the Hawk trainer (£750m) on which a decision in principle has been taken, additional Rapier (£50m), addditional combat support boats (£22m), 81mm mortar (£250m), Searchwater radar (£50m), and ICS3 (a naval communications system - (£50m)) - figures in brackets are approximate. Crucial decisions on some of these items - eg Searchwater and perhaps Hawk - could be made before the end of this year.

Conclusion

23. The choice to be made turns on four key factors, and a judgement has to be made about the weight to be attached to them individually and in the round. They are:

(a) operational capability (in the short and in the longer term);

(b) cost and budgetary aspects;

(c) importance of indigenous technological capability;

(d) the international dimension.

24. On operational capability the main questions are:

(a) in the long term ALARM can be more readily enhanced to deal with improvements on Warsaw Pact defences: decisions on improvements to HARM will be in the hands of the Americans (paragraph 7);

(b) in the short term the risks involved in the development of ALARM could lead to a period when the RAF's ability to penetrate Warsaw Pact defences would be reduced (paragraph 8).

25. The cost and budgetary aspects can be summarised as follows -

(a) at present prices, HARM costs £134m less than ALARM: the final cost difference could be less or more depending on relative inflation in te USA and UK, exchange rate movements and changes in the requirement (paragraphs 9-10);

(b) purchasing ALARM would put some extra pressure on the defence budget in the PES years and could involve defence programme changes in other areas (paragraph 19).

26. The importance of indigenous technological capability, together with the related question whether the ALARM programme is the best way of retaining it, is a matter on which Departments differ. The important area is the homing-head. Departments agree that homing-head and guidance technology will be of increasing importance in modern weapon systems. They disagree on whether the ALARM programme represents the only effective way of preserving the technology and the weight to be attached to the economic and industrial factors (paragraphs 12-16).

27. The international dimension consists primarily in the negative effects which a decision to buy ALARM might have on prospective sales of British defence equipment to the United States (paragraphs 20-22).