



MINISTRY OF DEFENCE  
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MO 26/7/4

31st January 1985

Dear Charles,

Prime Minister.  
Re SDI remain  
sceptical.  
CDP  
31/1

STRATEGIC DEFENCE INITIATIVE: EFFECTIVENESS AGAINST  
CRUISE MISSILES

At the December meeting between the Prime Minister and President Reagan in Washington, the Prime Minister asked whether the SDI would possess a capability against Cruise missiles (CM). Mr McFarlane, the President's National Security Advisor, replied that the short answer was that it would.

This claim is surprising at first sight. Whilst the SDI is only in the research phase and it is unclear which particular components will become part of an eventual system, it seems inherently unlikely that a system optimised to counter a ballistic missile (BM) threat could also deal with small, low-flying, subsonic cruise missiles, given the very different characteristics of the two types of missile in terms of both physical properties and flight patterns.

The principal challenge of CM is one of detection. Of the two detection methods proposed for the SDI, space-borne radar might be able to pick up aircraft as small as current CM, but identification would be difficult, infra-red systems would be defeated by cloud cover - a greater problem over Northern Europe than the Continental USA. CM are highly manoeuvrable and their launchers are mobile, making it difficult to acquire them at an early stage of their flight or retain continuous contact. The slower speed of CM compared to BM would allow a longer period for detection, perhaps even hours, rather than minutes, but it is unlikely that this would wholly compensate for the problems of detection and tracking. The scope for cost effective counter-measures is considerable; in particular the development of stealth technologies is likely to increase the problems of detection in the future.

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Professor Norman has been able to obtain some clarification of the US position following a brief discussion with the President's Scientific Advisor, Dr George Keyworth, during the latter's recent visit to the United Kingdom. It appears that the Soviet Union is developing a new generation of cruise missiles which are several times the size of existing CM and would operate at high level (15,000m) at speeds of over Mach 2. It is the SDI capability against this segment of the CM threat which appears to be the basis for the American optimism. Existing systems for detecting the launch of BM have been known to detect current tactical Soviet CM (such as the AS-4 KITCHEN) as well as manned aircraft, such as BACKFIRE, on reheat. The tracking and surveillance components of the SDI are likely to be even more effective in this respect. Once detected, interception could then be carried out by conventional weapons though the use of space-borne directed energy weapons may also be possible if the means the United States have proposed for countering atmospheric dispersion and distortion of the beam prove successful. Again, countermeasures could significantly reduce the performance of an SDI system.

On balance however it still seems unlikely that more than a partial CM defence is possible. Even this would require additional system components dedicated to CM interception, particularly in the European context. Partial defence may still be a desirable objective in itself though the SDI may not necessarily be the best means of providing it. Conventional defences using airborne detection and tracking could be just as effective against CM and the United States appear to be planning a major investment in their air defence radars and interceptors for this reason.

In conclusion therefore, whilst the current American research effort may alter the balance of judgement on certain aspects, it is improbable that a comprehensive defence against all classes of CM will emerge from the SDI programme. That is not to say it could not be achieved as a specific goal, if no expense were spared.

I am sending a copy of this letter to Peter Ricketts (Foreign and Commonwealth Office) and Richard Hatfield (Cabinet Office).

*Yours sincerely,*  
*Denis Brennan*

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