

Unacceptable Damage

Damage criteria in British nuclear planning

John Ainslie, February 2013.

Summary

The Ministry of Defence (MOD) has used the term “unacceptable damage” to define the level of destruction to be wrought by British nuclear weapons. This paper outlines the damage criteria developed in the 1960s and 1970s. It then focuses on the discussions into how to replace Polaris and the birth of the British Trident programme, between 1977 and 1982.

It is clear that at several times in the past there was not just one damage criterion, but two or more different criteria. In theory these criteria might be seen as the basis for decisions on the purchase of new nuclear weapon systems. In practice, the desire for a particular system has influenced the choice of criteria. This is evident in recurring arguments about the number of submarines that should be acquired.

In the case of the decision to replace Polaris with Trident, it might appear as if the selection of criteria preceded the discussion of alternative systems. However, the Navy had concluded that Trident was the best option in their own internal review, in 1977, before any criteria study was started. In addition, a review of the proposed criteria, at ministerial level, was deliberately delayed until a review of alternative weapon systems had been completed.

Between 1955 and 1962 the MOD commissioned research into the consequences of nuclear war. The Joint Interservice Group for the Study of All-out War (JIGSAW) calculated that the UK would need to detonate several hundred nuclear weapons to achieve breakdown of the Soviet Union. The MOD never sought to deploy the very high numbers of weapons which these studies implied, but they did, in due course, adopt some of JIGSAW’s ideas.

In 1962 the Joint Intelligence Committee (JIC) established two criteria for unacceptable damage, 5 cities and 20 cities. Both included Moscow. The lower criterion was based on the concept that the UK’s objective could be to weaken the Soviet Union’s power relative to the United States. This approach to measuring unacceptable damage reappeared in the Rationale for Strategic Nuclear Forces (1972) and in the Duff-Mason report (1978).

The 1972 study was set up because the MOD was concerned that Polaris would become ineffective as Russia deployed more Anti-Ballistic Missile (ABM) defences around Moscow. One of its conclusions was that the UK should adopt a penetrability criterion. The deployment of ABM defences signalled which areas the Soviet Union valued most highly. The report argued that a force which could attack these protected areas would automatically be able to inflict unacceptable damage. While attacking targets outside the ABM zone might be sufficient, it would be hard to prove or to quantify this.

The term “Moscow criterion”, which had been used for the 5 cities of the JIC 1962 assessment, was applied to this new penetrability requirement. From 1976 until 1982 the established level of damage to Moscow could only be guaranteed when two Polaris submarines were deployed. Alternative

target plans were developed for single-submarine targeting. These plans were aimed at a number of cities, 5 or 10, which were not protected by ABMs.

The level of damage which the UK should inflict on each city was based on the concept of breakdown, which had been developed by JIGSAW. In the early 1970s it was assumed that a city would breakdown and cease to function if there was severe structural damage to 50% of its buildings and 50% of its population were killed. In 1978 this threshold was lowered to 40% damage and fatalities. The use of ground-burst detonations, which produce large amounts of fallout, was considered in order to counter the effect of Soviet citizens taking shelter in civil defence bunkers.

During the 1970s the MOD developed an upgrade to Polaris, Chevaline, to overcome exo-atmospheric ABMs deployed around Moscow. In 1977 Denis Healey, the Chancellor, was having doubts about whether to spend more money on Chevaline. At the same time, David Owen, the Foreign Secretary, was arguing that British nuclear forces did not need to have the capability to destroy the Soviet capital. Meanwhile, officials were keen to begin studies into a successor to Polaris.

On 28th October 1977 Healey and Owen met with Prime Minister James Callaghan and Defence Minister Fred Mulley to discuss these issues. The four men agreed that there would be a study into the validity of the Moscow criterion, including its application to Chevaline. Officials then transformed this study into an investigation, led by Sir Antony Duff, into the deterrence criteria for a successor system. Owen insisted that ministers should have an opportunity to reach their own conclusions on these criteria. But a review of alternative systems was completed, based on the proposed criteria, before there was any input from Owen or Healey.

Officials persuaded Callaghan to hold back Duff's report from Owen and Healey for 6 months. They were worried that the two ministers might use the report as evidence that the Moscow criterion was not essential. This would have undermined the case for Chevaline. In July 1978 Callaghan postponed a ministerial review of Chevaline and personally authorised a further 12-months funding for the project.

Owen produced his own criterion of "one million dead. Michael Quinlan, who was then Deputy Under Secretary (Policy) in the MOD, described this as a strike of relatively modest proportions and an order of magnitude lower than what was required. Owen also argued that the MOD should acquire Cruise Missiles rather than Trident.

The criteria study was led by Antony Duff of the Foreign Office. Duff's report proposed three damage criteria – (1) command bunkers within and outside Moscow, (2) four cities including Moscow, (3) targets excluding Moscow. There were two alternatives in the third option, (3a) breakdown of 10 cities and (3b) one warhead on each of 30 targets. The report said that any of these would be adequate, but that Option 1 would provide a more certain deterrent than Option 2, and that Option 2 would provide a more certain deterrent than Option 3.

Before the start of this exercise an internal Navy report, in 1977, had already concluded that the best successor to Polaris would be Trident C4. In 1978 Ron Mason, Chief Scientific Advisor at the MOD, led a group which examined a number of systems that might replace Polaris, taking account of Duff's criteria. This group concluded that Cruise Missiles would be unlikely to meet any of the criteria and that the best ballistic missile option was Trident C4. Their study was combined with the work of the Duff group to form the Duff-Mason report.

Callaghan, Owen, Healey and Mulley considered the Duff-Mason report in December 1978. They felt that the proposed damage criteria were too destructive, but they authorised Callaghan to make an initial approach to President Carter, about Trident and Cruise Missiles, when the two leaders met at Guadeloupe in January 1979.

Callaghan passed the Duff-Mason report to his successor, Margaret Thatcher, when she became Prime Minister in May 1979. The Defence Policy Staff (DPS) then wrote a commentary on the report. They stressed the advantage of being able to destroy command bunkers (Option 1). This option had its origins in the 1972 report on the Rationale for Strategic Nuclear Forces. Attacking bunkers was an extension of the penetrability criterion. Francis Pym, Thatcher's Defence Minister, argued that a force which could threaten command centres would be more effective than one which could threaten only urban populations. In his presentation to a meeting of the MISC 7 committee, on 5 December 1979, Pym argued that the main criterion was to be able to threaten Moscow but that, in addition, Trident would enable the UK to threaten some of the command bunkers. This meeting agreed that the UK should acquire the Trident C4 missile system. However, it would appear that it did not reach any firm conclusions on what the damage criteria should be.

There are recurring references to criteria which could be met by two submarines rather than just one. The two 1962 criteria, 5 and 20 cities, could respectively be met when one or two Polaris submarines were on patrol. In the late 1970s the Moscow criterion could only be met when two vessels were available, and at other times an alternative target set was adopted. There were extensive discussions on whether four or five Trident submarines should be acquired. Two arguments were presented for the additional boat. One was that this would improve the chance of surviving Soviet Anti-Submarine Warfare activity. The other was that additional missiles were required to meet the Duff-Mason criteria. Option 1 could only be carried out if two submarines, armed with Trident C4 missiles, were at sea. By June 1980 the assumption was that four submarines would probably be adequate, but the option of purchasing a fifth was left open.

In order to improve the effectiveness of Trident C4 against the targets in Duff-Mason Options 1 and 2, the MOD explored the possibility of adding American-built penetration aids onto the C4 missile system.

In July 1980 the MOD published an Open Government document to explain the Trident decision. The paper, drafted by Quinlan, said that Trident would pose a threat to "key aspects of Soviet power". This was an attempt to signal that Trident would not be targeted on cities, per se. Quinlan later said that the phrase was added for ethical reasons, but this claim is questionable.

In November 1980 Ronald Reagan was elected President. The following year he accelerated the US Navy's move from Trident C4 to Trident D5. The MOD then considered acquiring C4 as a temporary measure, with a view to later upgrading to D5. By July 1981 Mason was advocating that the UK should procure D5 from the start. The MOD's argument for D5 was primarily on grounds of commonality. They did not want to repeat their experience with Polaris, which remained in service in Britain after it had been retired from the US Navy.

In 1978 the Duff-Mason report had argued that a major advantage of Trident C4 over other options was that it would be able to attack the command bunker targets in Option 1. However by July 1981 Mason was presenting a different case. He said that C4 was not accurate enough to be effective against these targets. It would take four warheads, on C4 missiles, to destroy a bunker. A single

warhead on the more accurate D5 missile could cause the same level of damage. The fact that only D5 was effective against the Option 1 targets was a subsidiary argument in its favour.

In January 1982 MISC 7 agreed to the proposal to acquire Trident D5. The plan was to have 16 missile tubes, but only 12 missiles on each submarine when they entered service. Each missile was to be armed with 10 nuclear warheads. The extra missile tubes were to provide an insurance margin in case there were improvements in Soviet ABM capability or in the hardening of their command bunkers.

In 1978 and 1979, while the MOD were studying a successor to Polaris, they also considered adopting Limited Nuclear Options (LNOs). LNOs were limited nuclear strikes against a selected group of targets. In the same period, the MOD also discussed the related issue of acquiring a new Long Range Theatre Nuclear Force (LRTNF) capability.

From 1974 LNOs became a feature of US and then NATO nuclear strategy. LNOs were developed for British nuclear forces within these NATO target plans. Subsequently, in December 1978, LNOs became part of UK national nuclear planning. In these plans the MOD prepared to launch a small number of Vulcan bombers in a proportionate response to a Soviet attack on a few targets in the UK.

From 1969 until 1982 Britain continued to operate nuclear-armed V-bombers in addition to Polaris. These aircraft had the potential to be deployed as LRTNF. In the late 1970s, as the Vulcans approached the end of their life, the MOD considered acquiring a new nuclear capability. This force would be specifically designed for the LRTNF role. Around this time the Government agreed that the US could Cruise Missiles in Britain. The archives reveal that the MOD were also considered acquiring similar missiles for themselves. This was one of the preferred options for a new UK LRTNF. However neither these weapons, nor any other new UK LRTNF system was purchased. The Chiefs of Staff had concluded that UK LRTNF was a lower priority than replacing Polaris and WE177 nuclear bombs

The documents on LNOs and LRTNF reveal that Polaris was regarded as essentially a one-shot last-resort force. As such it was unsuitable for LNOs or for the LRTNF role. Nevertheless, in the absence of a new LRTNF capability, Polaris and its successor would be expected, to a limited degree, to take on this additional task. Mason suggested that when two submarines were at sea, one could be in the LRTNF role. However, the Navy view was that two submarines were required for the primary, one-shot force and that additional targets could only be taken on when a third submarine was at sea.

In 1981 the MOD carried out a review of strategic nuclear targeting. DPS, with support from the Air Force and Army, argued that LNOs should be an important component of future nuclear planning. The Navy resisted any weakening of the traditional one-shot last-resort approach to submarine-based nuclear weapons. Admiral Leach, the Chief of Naval Staff, argued that there must be a single target list and a one-button-push. While the conclusions of this debate are not certain, it is likely that Leach's approach was modified to allow room for LNOs.

The new targeting policy appears to have proposed a shift from targeting cities, per se, to targeting specific facilities, some of which would be within cities. One identifiable focus was on targeting Soviet command bunkers.

One feature of the review was that it considered what the MOD should do with the additional capabilities which Trident would provide, in particularly the potential for attacking more targets. The review took place as the MOD prepared the case for D5 rather than C4. With D5 the UK was able to attack more targets with greater accuracy than with C4.

Leach and the Chief of Air Staff, Air Chief Marshall Beetham, agreed that Moscow should remain the core of the targeting policy. It is likely that the MOD envisaged attacks on specific facilities, primarily command bunkers, within the capital. The question was what to do with additional D5 missiles which would be available, over and above those required for an attack on the city. Leach used the term "Moscow plus hardened bunkers". This probably described an attack, similar to Duff-Mason Option 1, on bunkers within and outside the city. Beetham argued that some missiles should be available for LNOs, but Leach was against this.

Trident D5 missiles have sufficient range to reach targets across the whole of the Soviet Union from the UK. In a second stage of the targeting study, MOD staff were to identify potential targets East of the Urals. The results of this second phase are not known.

The MOD assigned two sets of target plans to Polaris. One was from NATO's plans and the other from the UK's own national plan. This report is focused on the latter. The MOD gave little regard to NATO target plans when it was deciding how to replace Polaris. The assignment to NATO was, however, a convenient point for the UK government to stress when presenting the case for Trident to allies in Europe and America.

JIGSAW and the British Nuclear Deterrent Study Group

Quinlan described how the MOD had determined the scale of British nuclear forces:

“Logic suggested, and it was occasionally attempted, to start with a judgment of the deterrent required and derive force levels from that ... however, the governing methodology amounted to assessing what the existing or intended force could do and then considering whether that sufficed.”¹

He wrote this comment as a description of the first years of British nuclear planning, but it is also an accurate description of what happened in later decades.

In 1971 an internal report described Britain’s first attempts to determine how many nuclear weapons the country needed as “largely guesswork”.²

During 1955 an Admiralty study group had explored various nuclear war scenarios. Their work impressed Lord Mountbatten and, in January 1956, he set up an inter-service group to continue this research. In 1959 this body was given the name Joint Interservice Group for the Study of All-out War (JIGSAW). Their early work advocated a substantial civil defence effort, because this would reduce the consequences of nuclear war. They argued that bombers were not an effective means of delivering nuclear weapons. They also said the UK should aim its weapons at cities rather than on counterforce targets such as airfields.³

JIGSAW developed the concept of “breakdown”. This took account of the fact that the number of people affected by an attack was significantly larger than the number of casualties. They examined the level of destruction that had, or had not, led to the breakdown of the UK, Germany, the Soviet Union and Japan in the Second World War. In the case of Japan they said that the country had broken down before the atomic bombs were dropped on Hiroshima and Nagasaki. JIGSAW estimated that breakdown of a nation would occur if 50 % of the total population or 75 % of the urban population of a nation were affected by a nuclear attack.⁴

JIGSAW applied the concept of breakdown to individual cities. They said that all of a city’s population would be affected, along with many in the surrounding area, if between 30% and 50% of the buildings were destroyed.

The group considered how many nuclear weapons would be required to achieve breakdown in the Soviet Union. They produced a wide range of figures. One estimate was that the detonation of 300-500 one-Megaton warheads would affect 75% of the urban population and result in breakdown. If the threshold was lowered to 50 % of the urban population, then the number of one-Megaton warheads delivered might be reduced to 100-200. In other estimates, JIGSAW calculated that as many as 17,670 warheads would be required.

In one study, JIGSAW calculated the level of destruction required for breakdown in Leningrad region. They concluded that this would require 8 one-Megaton warheads. Scaling this up across the Soviet

¹ The British Experience, Michael Quinlan in *Getting MAD: Nuclear Mutual Assured Destruction, its origins and practice*, Henry D Sokolski (Ed), Strategic Studies Institute, US Army War College, November 2004, p266.

² What is a deterrent ? paper by IJ Shaw D/D Sc 1/7 for CSA, 30 June 1971, DEFE 19-129 e2 page 1.

³ A JIGSAW puzzle for operational researchers: British global war studies, 1954-1962, Richard Moore, *Journal of Strategic Studies*, 1997.

⁴ What is a deterrent ? paper by IJ Shaw D/D Sc 1/7 for CSA, 30 June 1971, DEFE 19-129 e2

Union, they estimated UK forces would need to deliver at least 150-200 warheads to achieve the required level of damage across the country.

A report from JIGSAW to the Chiefs of Staff in February 1960 included three annexes. One considered deterrence by the threat of annihilation. This would require very large numbers of nuclear weapons and result in casualty levels of more than 80%. The second annex was on breakdown. The third was on denial of advantage to the Soviet Union in the East-West balance. In 1960 the MOD were particularly interested in taking forward this third approach.⁵ This may have influenced the 1962 Joint Intelligence Committee assessment, which used a weakening of the Soviet Union's position, vis-à-vis the United States, as one measure of unacceptable damage.

In 1959 the British Nuclear Deterrent Study Group (BNDSG) was considering the future of British nuclear forces. BNDSG reduced the high numbers of warheads proposed in the JIGSAW studies,

“BNDSG tried to strike some sort of reasoned balance between this quasi-scientific estimate and the commonly expressed view that no sensible Soviet Government could consider any territorial gain as an adequate recompense for the loss of Moscow, or perhaps of Leningrad”.⁶

BNDSG picked a figure of 40 cities. In August 1959 they asked JIGSAW to model the effect of an attack on this scale. It would require the delivery of 44 nuclear weapons, each with a yield of one Megaton. Four warheads would detonate over Moscow, two over Leningrad, and one over each of 38 other cities. This would kill 38 million people, 30 % of the urban population of the Soviet Union.⁷

Sir Robert Scott, chair of BNDSG, felt that 40 cities was an excessive criterion and that the group had selected this number on an arbitrary basis. He proposed a reduction to 10 cities. The RAF felt that 10 would be too few. The Treasury were in favour of a low figure, because this would reduce costs. Ministers in cabinet settled on a figure of 15 cities.⁸

1962 JIC assessment

In 1962 the Joint Intelligence Committee (JIC) made an assessment of unacceptable damage. They ranked cities in the Soviet Union, awarding points for size of population, civil and administrative centres, economic importance, military command posts and telecommunications facilities.⁹ JIC deliberately ignored psychological, technical and political factors.¹⁰ Unsurprisingly, Moscow was at the top of the list.

JIC's conclusion was

⁵ A JIGSAW puzzle for operational researchers: British global war studies, 1954-1962, Richard Moore, *Journal of Strategic Studies*, 1997.

⁶ Damage Capability of the POLARIS Force, Report from IJ Shaw (DCSO(R)) to AUS, 26 October 1967, DEFE 24-189 e54

⁷ British Nuclear Doctrine: The 'Moscow Criterion' and the Polaris Improvement Programme, John Baylis, *Contemporary British History*, Vol 19, No 1, Spring 2005.

⁸ British Nuclear Doctrine: The 'Moscow Criterion' and the Polaris Improvement Programme, John Baylis, *Contemporary British History*, Vol 19, No 1, Spring 2005.

⁹ The rationale for the United Kingdom Strategic Nuclear Force, Annex A to COS 45/72, from Chiefs of Staff Committee to Secretary of State for Defence, 25 April 1972, DEFE 13-752 e41a, page A-15

¹⁰ *ibid*

“that the destruction of twenty major cities would be an unacceptable blow but that it would also not be unreasonable to say that Soviet leaders would consider that the certain destruction of their five largest cities would put them at an unacceptable disadvantage in relation to the United States”.¹¹

The new criterion was a suitable match for the Polaris submarine system which the UK acquired when the US government cancelled Skybolt in December 1962.

The second part of the JIC assessment, five largest cities, became known as the “Moscow criterion”.¹² This threshold was in force until 1972.¹³ In March 1972 it was summarised as “the destruction of Moscow and the next four largest cities in the USSR”.¹⁴

The initial part of the criterion, the 20-city threshold, could only be met if two Polaris submarines were on patrol. This would have been possible if, as originally intended, the UK had built five submarines. In 1964 Chief of Naval Staff used this 20-city criterion as the basis for arguing, unsuccessfully, for the construction of a fifth boat.¹⁵ Even with only four submarines, the MOD planned to have the second boat available for deployment at 48 hours notice.

In 1965 the MOD’s expectation had been that, taking account of missile reliability, one boat could deliver 13 of its 16 missiles to their targets. This would result in the destruction of Moscow, Leningrad and five or six other cities. With two boats at sea a further thirteen cities could be destroyed.¹⁶

A 1967 study considered the effect of an attack on 30 cities from two submarines. It concluded that there was a 96 % chance that nuclear warheads would hit 20 of the cities, if there were no effective ABM defences.¹⁷

In 1969, the capability of the Polaris fleet was described in the following terms:

“We have previously accepted that the assured strike-second destruction of 7 to 10 cities, including Moscow and Leningrad, which one Polaris submarine always on patrol would provide, is enough to give an independent strategic deterrent of some significance; although

¹¹ Evolution of British Strategic Nuclear Capability, 9 March 1978 DEFE 68-405 36

¹² “[JIC in 1962] felt that it would not be unreasonable to say that the Soviet leaders would consider that the certain destruction of their five largest cities would put them at an unacceptable disadvantage in relation to the United States Moscow was one of the five and because of this the JIC assessment came to be known as the ‘Moscow criterion’”. The rationale for the United Kingdom Strategic Nuclear Force, Annex A to COS 45/72, from Chiefs of Staff Committee to Secretary of State for Defence, 25 April 1972, DEFE 13-752 e41a, page A-15

¹³ “the current criterion of deterrence, based on JIC(62)10, relates to the certain destruction of the five largest Soviet cities, including Moscow”, Questions related to the effectiveness of the UK nuclear deterrent, Annex to letter from Defence Intelligence Staff to Sir Stewart Crawford (Chair of JIC), 16 May 1972 DEFE 13-752 e48; This is repeated in The rationale for the United Kingdom Strategic Nuclear Force, Annex A to COS 45/72, from Chiefs of Staff Committee to Secretary of State for Defence, 25 April 1972, DEFE 13-752 e41a, page A-15;

¹⁴ UK Strategic Nuclear Forces Long Range Working Party - Air Force Department Study of Air Delivered Systems, 24 March 1972, AIR2 19184 b3

¹⁵ Maintaining the Moscow Criterion: British Strategic Nuclear Targeting 1974-1979, Kristan Stoddart Journal of Strategic Studies, Vol 31, No 6, December 2008, page 900

¹⁶ Notes on Mr Robin Cook MP’s article in the New Statesman. DCA(PN) 516/79. 15 January 1979

¹⁷ Damage capability of the Polaris force, Report from IJ Shaw (DCSO(R)) to AUS, 26 October 1967, DEFE 24-189 e54. This assumed 75 % reliability from Polaris missiles.

the margin would be narrow and the 20 city capability given by two submarines always on patrol would be more convincing.”¹⁸

In June 1971 the MOD still felt that one submarine could deliver 13 missiles on Moscow and up to ten other cities.¹⁹ However, there was growing concern about the impact of improving Soviet ABM defences. The deployment of comprehensive radar cover would mean that, in the second half of the 1970s, the UK would not be able to carry out a breakdown-level attack on Moscow if there was only one boat at sea.²⁰

Hermann Bondi’s personal views 1971

In October 1971 Hermann Bondi, Chief Scientific Adviser at the MOD, wrote a paper with his personal views. For nuclear forces in “a truly national role”, he said -

“One might imagine that the loss of Riga or Odessa would be quite sufficient, that aiming for Murmansk or Minsk would be more than ample”.²¹

He added that a greater capability, not necessarily against Moscow, would be required for UK nuclear forces to protect Germany –

“A serious chance of the destruction of Moscow alone should be more than enough; alternatively a high probability threat to say, all of Murmansk, Kharkov and Kiev should be ample”.²²

Bondi’s approach was criticised by two MOD officials who received his paper.²³ So, he revised the text -

“the necessary effectiveness of the UK deterrent must lie between a severe threat to some of the cities of the type mentioned, and a serious risk to Moscow
... [for the national role] a severe threat to major USSR cities other than Moscow may be enough, a serious threat to Moscow would certainly be sufficient
... a truly European deterrent (protecting Germany independently of USA) must be evidently effective against Moscow”²⁴

Rationale for the Strategic Nuclear Deterrent Force and JIC assessment 1972

By 1967 the government were aware of the need to improve Polaris, if it was to be capable of penetrating ABM defences around Moscow. In 1972 a series of studies were carried out into future options for UK nuclear forces. On 7 January 1972, Lord Carrington, Defence Minister, commissioned

¹⁸ CAB 130-1128 Prospects for nuclear collaboration within NATO including prospects for an anglo-French nuclear force, MISC 237(69)5, 26 March 1969.

¹⁹ DEFE 13-752 e18a UK Strategic Nuclear Force – Short Term Working Party Report, 3 June 1971.

²⁰ DEFE 13-752 e18a UK Strategic Nuclear Force – Short Term Working Party Report, 3 June 1971.

²¹ The purpose of the UK’s deterrent, CSA 28 July 1971, Chief Scientific Adviser’s personal views on nuclear deterrent, 1971 – 74, DEFE 19-129 e3

²² The purpose of the UK’s deterrent, CSA 28 July 1971, DEFE 19-129 e3. The paper concludes “Such a weapon must be sophisticated enough to threaten at least some of the most important cities in the USSR though probably not necessarily the most important one, Moscow”.

²³ “Would you want to explain to the French that the UK capability was designed to have a 50% chance of destroying Riga” – V Macklen, DEFE 19-129 e4; “I do not think that the loss of a couple of cities in western USSR, or of some military airfields or power stations in eastern Europe would make any real difference in the standing of the USSR vis-a-vis the USA” – IJ Shaw, DEFE 19-129 e5;

²⁴ The purpose of the UK’s deterrent, CSA, 13 October 1971, DEFE 19-129 e6

an MOD study into the rationale for strategic nuclear forces.²⁵ Admiral Hill-Norton, Chief of Defence Staff presented the resulting report to on 25 April 1972.²⁶

The report explained the basis of the 1962 five-city criterion,

“This assessment was based on what the Soviet leaders would consider to be unacceptable damage on the premise that the latter would clearly be unwilling to accept such a degree of damage as would severely reduce the Soviet Union’s economic and military strength in its struggle to overtake the United States and dominate the world”.²⁷

It is reasonable to assume that this approach remained central to the MOD’s approach in 1972.

The study considered the significance of Moscow and argued,

“While we believe that Moscow will continue to have a special significance in Russian eyes, the Soviet Union has put considerable money and effort into developing a military and political command system able to survive a nuclear attack, even though Moscow may have been destroyed. In military terms therefore the ‘Moscow criterion’ may well be of diminishing importance if interpreted as relating specifically to Moscow”.²⁸

This argument about command centres did not have an immediate effect on the criterion adopted later in 1972, but it was an important feature of the Duff-Mason report, six years later.

The 1972 report went on to argue that the Russian ABM system protected the areas they considered particularly vital and that this could suggest what might constitute unacceptable damage,

“It seems to us that, by definition, a strategic nuclear capability which could penetrate Soviet ABM defences would be able to strike at certain targets which the Russians themselves would have implicitly defined as highly important to them”.²⁹

“we believe that if we possess the capability to penetrate the defences we shall possess the option to strike targets which prima facie will be considered of the highest importance by the Soviet Union itself.”³⁰

In a summary of the report, Hill-Norton wrote, “We have deduced this ‘penetrability’ criterion as the overriding factor”.³¹ The argument was not that the UK should retain the capability to threaten Moscow despite the improving ABM defences, but that the UK should deliberately target the areas protected by this defensive shield.

The report argued that while an attack on targets outside the area protected by the ABM system might be sufficient, it would be difficult to prove or quantify this. Whereas, if they had the ability to

²⁵ DEFE 13-752 e26 Strategic Nuclear Deterrent Force MO 18/1/1 7 January 1972.

²⁶ DEFE 13-752 e41 The Rationale for the United Kingdom Strategic Nuclear Deterrent Force, Chief of Defence Staff, 25 April 1972.

²⁷ DEFE 13-752 e41 The Rationale for the United Kingdom Strategic Nuclear Deterrent Force, Chief of Defence Staff, 25 April 1972.

²⁸ DEFE 13-752 e41a The Rationale for the Strategic Nuclear Deterrent Force, 25 April 1972. Page A-16

²⁹ DEFE 13-752 e41a The Rationale for the Strategic Nuclear Deterrent Force, 25 April 1972. page A-16

³⁰ DEFE 13-752 e41a The Rationale for the Strategic Nuclear Deterrent Force, 25 April 1972. Page A-17

³¹ DEFE 13-752 e 39 The Rationale for the Strategic Nuclear Deterrent Force, Chief of Defence Staff, 20 April 1972.

penetrate these defences they would be able to attack those targets which were important to the Soviet Union.

The British assessment of the Russian ABM system was critically dependent on US intelligence information.³² In 1971 the CIA view was that the construction of ABM defences around Moscow indicated that the Soviet leadership considered the capital city to be particularly important.³³

Following the report on the Rationale for Strategic Nuclear Forces, the Chiefs of Staff asked JIC to review their 1962 assessment. On 16 May 1972 the Defence Intelligence Staff (DIS) asked JIC questions on Soviet ABM defences, the importance of including Moscow, whether attacking Moscow alone would be sufficient and whether attacking targets outside Moscow would be adequate.³⁴ In their request, DIS repeated the argument that the Soviet Union's deployment of ABM was itself a sign of what they valued most highly.³⁵

The main conclusion of JIC's assessment was that "provided we had the ability to destroy Moscow we would have the ability to inflict unacceptable damage on the Soviet Union."³⁶

An Air Department study in June 1972 had suggested a possible alternative, targeting Moscow and Leningrad.³⁷

Effect of ABM defences

In June 1973 an assessment of the effectiveness of Polaris against the Moscow ABM system said that the probability of 12 warheads penetrating the defences was between 45 %, based on the "worse than worst" case, and 88%, in the best case.³⁸

Concern about the Moscow ABM defences led to the development of Chevaline, which was able to swamp the defensive missiles with decoys. Chevaline was not operational until 1982. Several years earlier the MOD reached the conclusion that they might not be able to launch an effective attack on Moscow when only one Polaris submarine on patrol in the Atlantic.³⁹ In March 1976 Field Marshall Lord Carver, Chief of Defence Staff, recommended that Polaris be retargeted, either to attack Moscow from the Mediterranean or to attack 10 other cities. In June 1976 the MOD proposed that

³² "Our knowledge of Russian ABM defences, on which the credibility of our national deterrent plans and our ability to improve Polaris depend, is based on special US intelligence information." DEFE 13-752 e18a UK Strategic Nuclear Force – Short Term Working Party Report, 3 June 1971.

³³ A CIA assessment of the development of the Moscow ABM is available in National Intelligence Assessment: Soviet Strategic Defences, 1971, http://www.foia.cia.gov/docs/DOC_0000278526/DOC_0000278526.pdf

³⁴ Questions related to the effectiveness of the UK nuclear deterrent, Annex to letter from Vice Admiral Le Bailly (DIS) to Sir Stewart Crawford (Chair of JIC), 16 May 1972 DEFE 13-752 e48

³⁵ "a strategic nuclear capability which could penetrate Soviet ABM defences would be able to strike at certain targets which the Russians themselves would have implicitly defined as highly important to them". Letter from Vice Admiral Le Bailly (DIS) to Sir Stewart Crawford (Chair of JIC), 16 May 1972 DEFE 13-752 e48

³⁶ Quotation from 1972 JIC Assessment in Draft Background Brief for Foreign and Commonwealth Secretary, British Strategic Nuclear Deterrent, 22 June 1976, DEFE 19-274 e28a annex 2a;

³⁷ AIR 2-19184 c UK SNF LTWP addendum to AFD study of air-delivered systems, 20 June 1972

³⁸ DEFE 19-272 e12 Polaris improvements, CSA, 6 June 1973. Handwritten comment.

³⁹ "We are now no longer able to guarantee penetrating the Moscow defences from a single submarine on patrol in the Atlantic". Draft by Michael Quinlan of a reply from the Secretary of State for Defence to the Prime Minister, Chevaline, 14 September 1977, DEFE 70-783 e14.

targeting 5 of these other cities would be sufficient.⁴⁰ Michael Quinlan argued that excluding Moscow was only acceptable as a temporary arrangement.⁴¹

In 1977 Quinlan wrote that Soviet ABM defences were to protect Moscow in the event of an attack from Britain, France or China, rather than from the US, which would be able to swamp the limited number of ABMs that were deployed.⁴²

Breakdown calculations

The level of destruction required in each city from Polaris/Chevaline was defined in terms of breakdown:

“In the targeting of our existing nuclear capabilities against Soviet cities under present war plans, the damage criteria used is based not on destroying the whole city or killing a specified number of people but instead on creating sufficient damage to bring about the breakdown of the city as a functioning community”.⁴³

A 1971 study of future RAF strategic nuclear requirements revealed the level of blast damage from a nuclear explosion which was required for breakdown:

“The wartime Japanese and postwar nuclear test data, show that a casualty level of 30-50% - the collapse threshold – is directly related to about the same level of severe damage to domestic structures and of moderate damage to larger administrative and industrial buildings. The achievement of this latter degree of damage demands a level of nuclear effects corresponding to a blast over-pressure of 5-6 psi.”⁴⁴

In 1977 the threshold of destruction to bring about breakdown was estimated to be Severe Structural Damage to 50% of the buildings in a city. During that year the MOD considered reducing this 40%.⁴⁵ The new standard was adopted by 1978.⁴⁶ This would result in over 40% fatalities:

“Assuming that the warheads were detonated in the air at the optimum height to maximise blast damage, against a target with uniformly distributed, unwarned population occupying buildings with load-bearing walls, at least 40% of those in the city at the time of the attack

⁴⁰ Maintaining the Moscow Criterion: British Strategic Nuclear Targeting 1974-1979, Kristan Stoddart, *Journal of Strategic Studies*, Vol 31, No 6, December 2008, page 909

⁴¹ “To accept this situation for a limited near-term period, during which the Soviet Union will know that we are developing an improved capability, is an utterly different matter from a positive and unconcealable decision to surrender for the indefinite future any prospect of assured penetration, and to make this surrender moreover by cancelling our programme in midstream”. Draft by Michael Quinlan of a reply from the Secretary of State for Defence to the Prime Minister, Chevaline, 14 September 1977, DEFE 70-783 e14

⁴² “these can only be directed to non-US threats; the US could swamp them easily”, Chevaline and Successor Systems, cover note for Defence Secretary’s ministerial meeting, Michael Quinlan, 24 October 1977, DEFE 70-783 e59

⁴³ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

⁴⁴ Long Term Strategic Nuclear Working Party Interim Report, 30 August 1971, AIR2 19184 a24

⁴⁵ Future Strategic Systems, report of a Navy Department working group, 1977, DEFE 19-271 e42

⁴⁶ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

would be killed outright, a further 15% might be so seriously injured that they needed to be treated in hospital, and another 15% might suffer light injury".⁴⁷

In the late 1970s the Ministry of Defence considered the impact of Soviet civil defence measures on their attack plans. They assessed the effect of an attack on Leningrad using groundburst rather than airburst nuclear explosions. In a groundburst attack the area within which buildings were damaged would be halved, but the casualties could still be higher because there would be far more radioactive fallout -

"in near-still-air conditions, ground-bursts would subject 55-60% of the city to a radiation dose sufficient to cause rapid debilitation followed by death for most people in the area, and to contaminate food, water, air and both damaged and undamaged buildings. Residual radiation would remain a hazard for many years to come."⁴⁸

The conclusion was that so long as Britain left open the possibility of ground-burst detonation of warheads, then Soviet civil defence measures would not provide adequate protection.

Origin of Duff group (1977)

During the early 1970s officials in the Navy began to consider a replacement for Polaris.⁴⁹ In May 1976, Fred Mulley, the Defence Minister, banned all work on a successor system for two years. James Clarke, head of the Polaris Programme Assessment Group, ignored the ban and produced his own analysis. He described Mulley's order as being like King Canute trying to stop the tide.⁵⁰

In August 1977 Prime Minister Jim Callaghan indicated that the time might be right to begin a study into a successor system. Denis Healey, the Chancellor, was concerned about the rising cost of Chevaline. Foreign Secretary David Owen was challenging the Moscow criterion, although he accepted that it was too late to cancel Chevaline.⁵¹ In the Autumn of 1977 the Cabinet Office and the Foreign Office asked for an update of the 1972 JIC assessment. The review, which was completed in less than one month, reaffirmed the Moscow criterion.⁵²

⁴⁷ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

⁴⁸ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

⁴⁹ A Long Term Working Party was set up in December 1970 to consider how to retain strategic nuclear forces beyond the mid 1980s. Strategic Nuclear Deterrent Successor System Study, 8 September 1977, DEFE 70-783 e3

⁵⁰ "a political veto on the subject was imposed in the well-practiced tradition of Canute, and officially it still applies. The paper is circulated only to those with whom I have discussed the subject one way or another over the last year or so. At least it limits the readership of my 'folly'!" Longer Term Basis of UK Deterrent, James Clarke, head of the Polaris Programme Assessment Group, 27 May 1977, DEFE 19-271 e30

⁵¹ Chevaline and Successor Systems, cover note for Defence Secretary's ministerial meeting, Michael Quinlan, 24 October 1977, DEFE 70-783 e59.

⁵² "The Moscow criterion holds good. The JIC have updated the facts on which the judgment of its importance rested, and there is no basic change." Chevaline and Successor Systems, cover note for Defence Secretary's ministerial meeting, Michael Quinlan, 24 October 1977, DEFE 70-783 e59.

Against this background, Callaghan, Healey, Owen and Mulley met on 28 October 1977. The main issue for the meeting was Chevaline. Consideration of a successor system was part of a second item on “military nuclear issues”.⁵³

The Moscow criterion was discussed as a sub-item under Chevaline –

“the view was strongly expressed that the criterion on which the effectiveness of our existing deterrent was judged – namely its capacity to penetrate the ABM defences round Moscow and destroy 40 per cent of the Moscow region – should be re-examined.”⁵⁴

It was argued that the Soviet Union would not risk the damage that could be caused by attacking alternative targets outwith Moscow and that they could not be certain that no missiles would reach Moscow, even if Polaris was not improved. The main argument for retaining the Moscow criterion was that abandoning it could not be concealed. Admitting that Britain couldn’t hit the capital would weaken the credibility of the deterrent as a whole.⁵⁵ Denis Healey argued that Chevaline should be cancelled if the Moscow criterion was not required.⁵⁶

The meeting commissioned three studies. One was into Cruise Missiles. The second was on the timing of decisions on a successor. The third was “a study of the continuing validity of the Moscow criterion for the effectiveness of a British deterrent.”⁵⁷

There were two motives for the third study. The first was Owen and Healey’s concern about the Moscow criterion. The second was that the Ministry of Defence wanted to investigate the deterrence criteria for a successor to Polaris.⁵⁸

The relationship between this Moscow-criterion study and Chevaline was left vague –

“It was agreed that continuation of the Chevaline programme and acceptance or rejection of the Moscow criterion were not necessarily linked”.⁵⁹

⁵³ Nuclear Meeting: 28 October, paper from Sir John Hunt to Jim Callaghan, 25 October 1977, PREM 16/1564 e10; Chevaline and Successor Systems, cover note for Defence Secretary’s ministerial meeting, Michael Quinlan, 24 October 1977, DEFE 70-783 e59

⁵⁴ Conclusions of a ministerial meeting held at No 10 Downing Street on Friday 28 October 1977 at 0945, PREM 16-1564 e15

⁵⁵ Conclusions of a ministerial meeting held at No 10 Downing Street on Friday 28 October 1977 at 0945, PREM 16-1564 e15

⁵⁶ “[On 28 October 1977] Mr Healey tended to argue that if the Moscow criterion was unnecessary Chevaline should be cancelled”, Criteria for Deterrence, Draft minute from Sir John Hunt to Prime Minister, 12 July 1978, DEFE 23-219 e71; The minutes of the meeting say – “it was suggested that if it were decided to abandon the Moscow criterion the case for continuing with Chevaline should also be re-examined”, Conclusions of a ministerial meeting held at No 10 Downing Street on Friday 28 October 1977 at 0945, PREM 16-1564 e15

⁵⁷ Nuclear Matters, Note of a meeting held in Sir John Hunt’s Room, 2 November 1977, DEFE 68-405 e1

⁵⁸ “As an early part of the study, it will be necessary to make a preliminary assessment of the criteria which any successor system will have to meet”. Strategic Nuclear Deterrent Successor System Study, Report by the Assistant Chief of Defence Staff (Policy), 8 September 1977, DEFE 70-783 e3

⁵⁹ Conclusions of a ministerial meeting held at No 10 Downing Street on Friday 28 October 1977 at 0945, PREM 16-1564 e15; “Although Ministers had not related the study to a particular timescale, it was seen as an issue distinct from the continuation of Chevaline and thus not restricted to the period in which Polaris would remain effective”, Nuclear Matters, Note of a meeting held in Sir John Hunt’s Room, 2 November 1977, DEFE 68-405 e1

The meeting concluded that the Chevaline programme should continue for the time being and “as a separate issue” there should be a study into the Moscow criterion.⁶⁰

On 2 November 1977 Sir John Hunt, the Cabinet Secretary, brought together a small group of senior officials to discuss how to take forward the three studies. The review of the Moscow criterion became “a fundamental review of our philosophy of deterrence”.⁶¹ It was to “avoid any preconceptions of about the importance of Moscow as a target”.⁶² The task was assigned to a small “Criteria for Deterrence” group chaired by Sir Antony Duff.⁶³

In December 1977 ministers approved an overall study into a successor to Polaris. Hunt drafted the Terms of Reference. The amendments to these Terms of Reference reveal different views on the purpose of the Duff group’s work. The first draft referred to a study into the “effectiveness of the British deterrent.”⁶⁴ This was corrected and replaced with their original aim “to examine the continuing validity of the Moscow criterion”.⁶⁵ However, at their first meeting the Duff group moved away from this focus on Moscow. They noted that their work was to be part of the wider study into a replacement and they concentrated on establishing the criteria for a successor system.⁶⁶

Hunt’s first draft of the Terms of Reference for the wider study said that the “conclusions” from the Duff group would form the Criteria for Deterrence section of the overall report.⁶⁷ Owen amended this to “the conclusions which Ministers reach on this group’s report”.⁶⁸ The four ministers should have had a chance to look at the Duff report and to reach their own conclusions before the full study was completed, but this did not happen.

One issue was what period of time the Duff group would focus on, as they projected future requirements. In November 1977 Sir Clive Rose, Cabinet Office, drafted an outline of the group’s possible work. One sub-heading in his paper was – “Forward look (to 2000)”. At their initial meeting, in January 1978, the group agreed that they would consider a timescale of up to 2010.⁶⁹ In July Quinlan said their report was focused on the period 1990-2015, when a successor system would be in service.⁷⁰ Pushing back the timescale increased the focus on the successor system, rather than Chevaline.

⁶⁰ Conclusions of a ministerial meeting held at No 10 Downing Street on Friday 28 October 1977 at 0945, PREM 16-1564 e15

⁶¹ Nuclear Matters, Note of a meeting held in Sir John Hunt’s Room, 2 November 1977, DEFE 68-405 e1

⁶² Nuclear Matters, Note of a meeting held in Sir John Hunt’s Room, 2 November 1977, DEFE 68-405 e1

⁶³ Duff had been a submarine captain in the war and had then joined the Foreign Office. In 1978 he was chairman of the Joint Intelligence Committee.

⁶⁴ Terms of Reference for a Study of Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Sir John Hunt, 9 December 1977, PREM 16-1564 e36a

⁶⁵ Terms of Reference for a Study of Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Sir John Hunt, 23 December 1977, PREM 16-1564 e37

⁶⁶ Criteria for Deterrence, Note of a meeting on 4 January 1978, DEFE 68-405 e2

⁶⁷ Terms of Reference for a Study of Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Sir John Hunt, 9 December 1977, PREM 16-1564 e36a

⁶⁸ David Owen’s amendment was proposed in United Kingdom Nuclear Deterrent, EAJ Fergusson to Bryan Cartledge, 22 December 1977, PREM 16-1564 e36e, and accepted in Terms of Reference for a Study of Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Sir John Hunt, 23 December 1977, PREM 16-1564 e37

⁶⁹ Criteria for Deterrence, Note of a meeting on 4 January 1978, DEFE 68-405 e2

⁷⁰ Strategic Deterrence, letter from Sir Frank Cooper to Sir John Hunt, 5 July 1978, DEFE 23-219 e67. The letter had been drafted by Michael Quinlan, DEFE 23-219 e64

In October 1977 the ministerial group had agreed that Duff's study would not be restricted to Chevaline. Once it was underway, it excluded consideration of Chevaline.

Rose's initial outline shows a heading "Criteria for Deterrence". This had three sub-headings – Minimum criterion, maximum criterion and targeting options.⁷¹

Duff Group recommendations

The Duff group considered two ways of assessing unacceptable damage:

"a. if the general level of destruction likely to be suffered by the Soviet Union was such as to outweigh the benefits from removing the UK from the international scene and/or appropriating her resources;

"b. if the damage were likely to undermine, at least for a considerable period, the Soviet Union's ability to compete across the whole range of her capabilities as a super power with both the United States and China."⁷²

The second approach had also been the basis for the 1962 JIC assessment of Moscow plus four cities.

The Duff Group report described the Soviet Union as "a highly centralised state in which all important decision-making is centred on Moscow".⁷³ It argued that Moscow and Leningrad were particularly important,

"Both Russian tradition and preservationist practice suggests that special value, beyond that of material assets, is attached to certain places and that Moscow and Leningrad are particularly important in this sense".⁷⁴

In their final report, the Duff group presented three illustrative options of damage criteria:

- (1) Command centres inside and outwith Moscow.
- (2) Moscow, Leningrad and 2 other big cities.⁷⁵
- (3) Targets excluding Moscow – (3a) 10 cities⁷⁶ and (3b) 30 single-warhead targets.⁷⁷

⁷¹ Framework for the study of the criteria for deterrence, Clive Rose, 7 November 1977 DEFE23-291 e05

⁷² Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, DEFE 68-406 e21.

⁷³ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335 e44 Pt2 para 1.

⁷⁴ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335 e44 Pt2 para 4. This annex was included in DEFE 25-335 when it was first made public in the National Archives, but it was removed when the file was redacted for a second time.

⁷⁵ "breakdown level damage to Moscow, Leningrad and two other cities" DEFE25-434 e27ac page 8

⁷⁶ "breakdown level damage to 10 cities (excluding Moscow)" DEFE25-434 e27ac page 8

⁷⁷ The options are listed in Cabinets and the Bomb, Peter Hennessey, British Academy/OUP, 2007 and Maintaining the Moscow Criterion: British Strategic Targetting 1974-1979, Kristan Stoddart, The Journal of Strategic Studies, Vol 31, No 6, December 2008. The list of options has been redacted each time it appears in the files visible in the National Archives. However there are several individual references which disclose the meaning of each of the options, for example in The Future of the UK Nuclear Deterrent, A Commentary, by the Defence Policy Staff for the Chiefs of Staff Committee, 13 August 1975, DEFE 25-335 e97(i)

Their report concluded - "These three options are in order of certainty of deterrent effects; but we believe that any one of them would be adequate".⁷⁸

The "surest" deterrent was Option 1.⁷⁹ The Chief of Naval Staff commented, "Option 2 should be rated above Options 3A and 3B".⁸⁰ This implies that the deterrent would be more certain if the UK was able to effectively target Moscow.

The Duff group described, in an annex to their report, their basis for assessing "unacceptable damage".⁸¹ This shows how they calculated the level of damage which was required to bring about breakdown in one city. However it does not explain how they chose the number of cities that should be attacked. It is likely that the Duff group did not seek to define from scratch how many cities should be destroyed, but rather cast an eye over earlier proposals.

Option 2, breakdown-level damage to four cities including Moscow and Leningrad, was close to the five largest cities proposed by JIC in 1962. In May 1978 Michael Quinlan noted that, in his personal opinion, Option 2 was "a little on the 'heavy' side".⁸²

Option 3a, breakdown-level damage to 10 cities excluding Moscow, had been considered as a targeting option in 1975.

The group initially examined the potential of attacking four types of capability: (1) Governmental capability, (2) Military facilities, (3) Military research, development and production, and (4) Generalised destruction (urban areas).⁸³

They played down the potential for focusing on categories (2) and (3). Destruction of those military targets which Britain could attack would not constitute "unacceptable damage on a worthwhile scale".⁸⁴ Britain would only be able to attack a relatively small number of R&D or industrial targets, the loss of which would not undermine the military strength of the Soviet Union.

In their description of "governmental capability" the Duff group reported that the Soviet Union had command bunkers within Moscow for the hierarchy of the Communist Party, Government and Armed Forces. There were also alternative command bunkers outside the city to which the leadership would deploy, given sufficient notice. The report argued –

⁷⁸ Criteria for Deterrence draft report, 25 May 1978, DEFE 23-219 e50;

⁷⁹ The term surest is in a handwritten comment from "R" (Richard Mottram), Successor Systems, letter from Michael Quinlan, 22 October 1979, DEFE 23-221 e35.

⁸⁰ DEFE 25-433 e7 Nuclear Matters, Captain WA Higgins, on behalf of the Chief of Naval Staff, 8 December 1978

⁸¹ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

⁸² DEFE 23-219 e51 Criteria for Deterrence Michael Quinlan 26 May 1978

⁸³ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335. The use of four categories is mentioned in Working Party on Nuclear Matters, Cruise Missile Options for a UK Strategic Deterrent, 21 June 1978, DEFE 68-405 e21 para 10. This says that category 1 involves attacks on hardened targets. This is consistent with Annex A. The Cruise Missile Options report says category 4 was "RD and P", whereas Annex A has this as category 3.

⁸⁴ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

“The importance which the Soviet leadership attach to maintaining their administrative centre unimpaired is shown by these measures and by the effort expended in the complementary ABM defence system around Moscow.”⁸⁵

A map attached to the Duff report shows 8 command centres outside Moscow. It is likely that these, along with sites within the city, were key targets for Option 1. The ex-urban locations on the map include the General Staff Central Command Post, the General Staff Alternate Command Post, the Headquarters of the Strategic Rocket Forces, the two main Air Defence command posts and a key command centre for the political leadership.

One way in which the old Moscow criterion had been expressed was - “we must be certain of being able to inflict unacceptable damage on Moscow as the seat of the highly centralised Soviet Government system”.⁸⁶ Option 1 focused on the centres of the Government system rather than the city per se. The Duff Group were developing a theme raised six years earlier in the Rationale for the Strategic Nuclear Deterrent Force (1972).

At an early meeting, on 23 February 1978, the group decided to ask JIC for advice:

“An assessment was needed of whether the importance of Moscow as a target might be affected by measures which the Russians had taken or might take in the future to reduce its importance as a centre of government and party leadership”.⁸⁷

The Annex to the Duff report contains a statement which may have been based on JIC’s reply:

“The potential vulnerability of this [highly centralised] arrangement has been reduced not by devolution and decentralisation but by the provision of shelters hardened against nuclear attack within Moscow for the hierarchy of the party, the Government and the Armed Forces and their key staff; and of alternate bunkered offices for them to redeploy to, if sufficient warning time is received.”⁸⁸

If the leadership had departed from Moscow to their alternate command bunkers, then a British attack on Moscow would cause catastrophic damage to the capital city, but the top level of the Government system might survive. The same could be the case if they launched an airburst nuclear attack on the city while the leadership were inside bunkers deep below the city. On this basis, the Duff group proposed their new option - “to destroy the command centres of the Soviet political and military systems (both above and below ground) inside the Moscow ring road and extra ones in the wider Moscow area.”⁸⁹ This proposal, Option 1, was also described as: “disruption of the main governmental organs of the Soviet state”⁹⁰, “the loss of governmental control, with great collateral

⁸⁵ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

⁸⁶ Draft Minute from PUS to Secretary of State, 22 June 1976, DEFE 19-274 e28a para 4

⁸⁷ Criteria for Deterrence, minute of meeting 23 February 1978, DEFE 68-405 e3

⁸⁸ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

⁸⁹ Description of Option 1 in the Duff-Mason report from Cabinets and the Bomb, Peter Hennessey, OUP, 2007, page 324. In a footnote Hennessey says that this was “private information” that he had obtained.

⁹⁰ Defence Policy Staff Commentary, DEFE 25-335 e97(i), as quoted in Maintaining the Moscow Criterion: British Strategic Targetting 1974-1979, Kristan Stoddart, The Journal of Strategic Studies, Vol 31, No 6, December 2008. This phrase is also used in Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Summary, DEFE 19-275 e1 para 2.

damage”⁹¹ and “destruction of the Soviet governmental capability”.⁹² A letter from the Chief Scientific Adviser in September 1979 confirms that the targets in Option 1 included hardened bunkers.⁹³

The 1979 commentary from the Defence Policy Staff argued that targeting bunkers would be particularly effective if the objective was to weaken the Soviet Union vis-a-vis its major rivals –

“the loss of governmental control, with great collateral damage, at such a point would make the Soviet Union unacceptably vulnerable to the United States or even China, a situation the Soviet leadership could not accept”.⁹⁴

The Duff group probably included Option 1 and described it as the most effective option, because they interpreted the construction of new bunkers as a sign that the Soviet leadership placed great importance on the survival of the top hierarchy and because an attack on their command posts would leave them vulnerable to their major nuclear rivals.

The later suggestion that Option 1 may have been introduced to avoid civilian casualties is not consistent with the estimates of the number of warheads required -

“The demands made by Damage Criteria Option 1, in terms of ballistic warheads delivered, are about double those made by any other option.”⁹⁵

Twice as many warheads would detonate if Option 1 (governmental control) was implemented than if they followed Options 2 or 3 (cities). A large proportion of the warheads in Option 1 would land within Moscow. Most of the others would land within 50 miles of the city.⁹⁶

In an attack on bunkers the warheads would be detonated as groundburst. This would create less blast damage but much more fallout than the airburst detonation that would be used in a countercity attack. The combination of doubling the number of warheads and detonating them as groundburst would be likely to result in at least as many immediate fatalities as in a “breakdown” attack on Moscow. It would also lead to far greater environmental damage and subsequent long-term casualties.

Consideration of Duff Group report by the Callaghan Government

⁹¹ The Future of the UK Nuclear Deterrent, A Commentary, by the Defence Policy Staff for the Chiefs of Staff Committee, 13 August 1975, DEFE 25-335 e97(i).

⁹² Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Summary, DEFE 19-275 e1 para 2.

⁹² Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Summary of Part III, DEFE 25-434 e25b para 3

⁹³ “we need to consider: (a) whether there is sufficient information on hardened bunkers to lead us to recalculate the figures against Option 1.” Letter from Chief Scientific Adviser, 20 September 1979, DEFE 25-434 e25a

⁹⁴ The Future of the UK Nuclear Deterrent, A Commentary, by the Defence Policy Staff for the Chiefs of Staff Committee, 13 August 1975, DEFE 25-335 e97(i) para 15.

⁹⁵ The Future of the UK Nuclear Deterrent, A Commentary, by the Defence Policy Staff for the Chiefs of Staff Committee, 13 August 1975, DEFE 25-335 e97(i) para 21.

⁹⁶ Most of the bunkers identified in the Duff report are close to Moscow. An exception is the Alternate Command Centre for the Soviet General Staff at Kuznetsk-8, near Chaadayevka, 600 kilometers East of the capital.

By June 1978, only one month after the original deadline, the Duff report was close to completion. However, senior civil servants were reluctant to present it immediately to the ministerial group. It was withheld from Owen and Healey for 6 months.

There were two reasons for the delay. One was that the report was linked to a study into practical options for a successor which would not be completed until the end of the year. Officials argued that the reports should be taken together.

The other issue was that ministers were due to make a major decision on future funding for Chevaline in July 1978. The Moscow criterion provided the rationale for Chevaline. But Duff's report implied that the Moscow criterion was not essential. It said that Options 3a and 3b, which excluded Moscow, were adequate.

On 27 June 1978 Sir Douglas Wass of the Treasury wrote to Sir John Hunt, the Cabinet Secretary –

“There could be a problem about the progress report on Chevaline due to be put to Ministers shortly, especially if it is suggested that the project should now be funded to completion. The view taken in Tony Duff's report that the credibility of the deterrent could be maintained if we had the ability to cause unacceptable damage to certain major cities and other targets in Russia, excluding Moscow, seems to me to call the requirement for Chevaline into question.”⁹⁷

On 7 July Sir Frank Cooper, Permanent Under Secretary at the Ministry of Defence, wrote to Hunt in response to the points raised by Wass. Cooper argued that the Duff report addressed the situation from the 1990s to 2015, rather than the shorter timescale of Chevaline, and that “whatever the validity of the Moscow argument in the abstract, the abandonment (inevitably public) of Chevaline would be the worst possible way of proceeding.”⁹⁸

Hunt sent Callaghan a draft of the Duff report in July. The covering note referred to the proposed meeting on future funding for Chevaline –

“I am not sure that it would be right to seek such a decision now unless you want also to discuss the Moscow criterion study. ... If a long-term decision is sought on Chevaline I feel certain that both Dr Owen and Mr Healey will ask about the criteria study and the latter at least will be reluctant to agree to funding Chevaline to completion until it has been discussed.”⁹⁹

Following Hunt's advice, the Prime Minister postponed the ministerial review of Chevaline and authorised 12 months funding for the project.¹⁰⁰

Hunt wanted consideration of the Duff report to be put back until the end of 1978. Callaghan agreed to postpone it until the Autumn. On 27 October Hunt wrote to Callaghan explaining that the “Studies on the Future of the British Deterrent” were now in the form of a three-part report and that

⁹⁷ Criteria for Deterrence, letter from Douglas Wass to Sir John Hunt, 27 June 1978, DEFE 23-219 e57.

⁹⁸ Strategic Deterrence, letter from Sir Frank Cooper to Sir John Hunt, 5 July 1978, DEFE 23-219 e67. The letter had been drafted by Michael Quinlan, DEFE 23-219 e64

⁹⁹ Criteria for Deterrence, Draft minute from Sir John Hunt to Prime Minister, 12 July 1978, DEFE 23-219 e71

¹⁰⁰ “The Prime Minister had decided that:- (a) there will be no early Ministerial meeting to discuss the criteria for deterrence but there should be one in the Autumn. ..(b) he approves the funding of CHEVALINE for a further year from now on and Ministers will decide later about funding to completion.” Nuclear Matters, letter from Sir Frank Cooper, 10 August 1978, DEFE 23-291 e 84

it would be better to take all three sections together. This meant a further delay, until December, before the Chancellor and Foreign Secretary saw the Duff report.¹⁰¹ Duff's "Criteria for Deterrence" was part 2 of the overall Duff-Mason study. Part 1 was a paper on the politico-military background which had also been drafted by the Duff group. Part 3 was an analysis of alternative systems, including Trident, which had been led by Ron Mason, Chief Scientific Adviser at the MOD.

David Owen prepared an alternative paper of his own. He said "I am not convinced that the Soviet leadership would be willing to risk even a single major Soviet city for the limited prize of an attack on Britain alone".¹⁰² Owen offered a different criterion. He proposed that one million deaths anywhere in the Soviet Union would be "more than adequate".

The MOD criticised Owen's approach. Quinlan described one million dead as "a strike of relatively modest proportions".¹⁰³ He said the Duff-Mason report, "in effect proposes options an order of magnitude higher than this".¹⁰⁴

He went on to say,

"If we reduce dramatically, comparison with the French standard (and our own former standard) will be a major component of the subsequent evaluation our allies and our adversaries make".¹⁰⁵

Quinlan argued that the scale of destruction should relate to the 20 million Soviet civilians who had died in the Second World War.

Owen had been arguing for a force of submarines armed with Cruise Missiles rather than Ballistic Missiles. Cruise was, in due course, rejected on the grounds that it could not readily meet the Duff criteria, particularly the more demanding options 1 and 2. If the lower criterion proposed by Owen had been accepted, then Cruise might have been looked at more favourably.

Callaghan, Owen, Healey and Mulley finally met, five days before Christmas 1978, to discuss the report. They agreed that there was a strong case for Britain remaining a nuclear power, because the future was uncertain, but they felt that Duff's options were all "unnecessarily exacting".¹⁰⁶ Destroying less than 10 cities, excluding Moscow, might be enough.

There was a second ministerial meeting on 2nd January 1979 at which they was agreed that Callaghan should make an initial approach to President Carter, about Trident and Cruise, when the two leaders met in Guadeloupe. Carter gave a sympathetic response with regard to Trident, but Callaghan did not follow this up until urged to do so by Hunt on the eve of the May 1979 election.

Trident C4 decision

¹⁰¹ Studies on the Future of the British Deterrent, Draft minute from Sir John Hunt to Prime Minister, 27 October 1978, DEFE 23-291 e98

¹⁰² Letter from David Owen to Jim Callaghan, 11 December 1978, PM/78/138, Nuclear Papers, David Owen, Liverpool University Press, 2009, p 149.

¹⁰³ Nuclear Matters, letter from Michael Quinlan to PS to Secretary of State for Defence, 18 December 1978, DEFE 25-433 e21

¹⁰⁴ Nuclear Matters, letter from Michael Quinlan to PS to Secretary of State for Defence, 18 December 1978, DEFE 25-433 e21

¹⁰⁵ Nuclear Matters, letter from Michael Quinlan to PS to Secretary of State for Defence, 18 December 1978, DEFE 25-433 e21

¹⁰⁶ Cabinet Nuclear Defence Policy, Note of a meeting held at 10 Downing St on 21 December 1978, PREM 16-1978 e4

In May 1979 Margaret Thatcher became Prime Minister. She established a cabinet sub-committee, MISC 7, to handle the successor to Polaris. At their first meeting, on 24 May 1979, the committee considered the Duff-Mason report. They instructed officials to visit Washington to find out more about Trident and Cruise missiles.¹⁰⁷ In autumn 1979 a revised version of Part 3 of the Duff-Mason report was produced.¹⁰⁸ The MISC 7 meeting on 19 September eliminated the Air Launched Cruise Missiles (ALCM) option.¹⁰⁹ On 5 December MISC 7 decided that Trident C4 was the best option and that a formal approach should be made to the US.¹¹⁰ President Carter indicated that he would respond favourably but wished to defer the decision. There was a delay of 7 months. Washington was initially concerned that the proposed agreement might discourage NATO members from supporting plans for Long Range Theatre Nuclear Forces (Cruise and Pershing) and might affect Senate ratification of the SALT II treaty. Even when these arguments became less significant, Carter was still hesitant, anticipating that the agreement might be widely criticised.¹¹¹ The formal exchange of letters between Thatcher and President Carter took place on 10 and 14 July 1980.¹¹² The decision was announced to Parliament on 15 July.

Damage criteria and the Trident C4 decision

In August 1979 the Defence Policy Staff (DPS) produced a commentary on the Duff-Mason report for the Chiefs of Staff. The commentary challenged the report's conclusion that any one of the damage criteria options would be adequate. It rejected Option 3b (30 single-warhead attacks) as insufficient.¹¹³

The commentary repeated an argument that Quinlan had used in December 1978,

“The Soviet Union sustained over 20 million casualties in the Second World War and inflicted almost as many on itself between 1930 and 1950; this must give at least a measure of the threshold with which UK planning has to deal, and suggests that if a crude criterion of megadeaths is to apply, [redacted]”¹¹⁴

¹⁰⁷ CAB 130-1109 Minutes of MISC 7(79)1 24 May 1979; DEFE 25-433 e56 Future of the United Kingdom deterrent, extract from MISC 7 (79) 1st meeting; DEFE25-434 e21 Future of the United Kingdom strategic nuclear force – interim report, 5 September 1979.

¹⁰⁸ The amendments are listed in DEFE25-434 e19 and the revised version of Part 3 is in DEFE68-406 e21

¹⁰⁹ DEFE25-434 e57

¹¹⁰ “At the meeting of MISC 7 on 6 December 1979 Ministers agreed that the best weapon system with which to replace Polaris was the Trident I (C4) Multiple Independently Targettable Re-entry Vehicle (MIRV) system if it could be procured (less warheads) from the United States”. Cabinet - Nuclear Defence Policy – Future of the United Kingdom Strategic Deterrent: the present position, not by the secretaries, MISC 7(80)1, 29 May 1980. CAB130-1129.

¹¹¹ “Their essential fear is probably that a ‘new Nassau Agreement’ will be criticised (domestically and internationally) both as damaging to arms control and as encouraging Britain to stay in a nuclear league which is too big for her.” Cabinet - Nuclear Defence Policy – Future of the United Kingdom Strategic Deterrent: the present position, not by the secretaries, MISC 7(80)1, 29 May 1980. CAB130-1129.

¹¹² PREM 19-417 pages 147 and 167 www.margaretthatcher.org

¹¹³ Similarly, in May 1979, Michael Quinlan had written, “A good deal of MOD opinion would regard Option 3(b) as doubtfully adequate, though the point cannot be proved” DEFE 24-2122 e17 Successor to Polaris Michael Quinlan, 10 May 1979, briefing for Secretary of State for Defence prior to a meeting with the Prime Minister.

¹¹⁴ DEFE 25-335 e97(i) The future of the UK nuclear deterrent, A commentary, 13 August 1979, para 15

The redacted figure of megadeaths, may have been 10 million. This would have been consistent with the 1969 estimate that one Polaris submarine could cause breakdown-level damage to 7-10 cities, including Moscow. The death toll from such an attack would be in the region of 10 million.

The commentary stressed the importance of being able to attack Russian Command Bunkers (Option 1) -

“.. it is in just such circumstances of advanced escalation that Option 1 has greatest utility: the loss of governmental control, with great collateral damage, at such a point would make the Soviet Union unacceptably vulnerable to the United States or even China, a situation the Soviet leadership could not accept.”¹¹⁵

One advantage of a MIRV system, such as Trident, was that it was the only way to meet Option 1 - “Only a MIRV system can provide sufficient warheads with the accuracy to meet Criteria Option 1”.¹¹⁶ One of the arguments used in favour of Trident C4 as distinct from other ballistic missiles, in a presentation to MISC 7, was that non-MIRV missiles do not have “the accuracy to threaten hardened bunkers”.¹¹⁷

In October 1979 a note was written to Mrs Thatcher and the members of MISC 7 to accompany the revised Duff-Mason report. Paragraph 5 of this note, which dealt with the damage criteria, has been redacted.¹¹⁸ However, a handwritten comment by Richard Mottram implies that it focused on Option 1.

“The attached draft is pretty poor stuff. We seem to be mesmerised by criteria option 1 although the Duff report (behind) concluded: ‘Option 1 would provide greater certainty of deterrence; but we believe that any one of (the options) would be adequate.’ We ought to bring this out somewhere ! Plus the fact that we do not target the Governmental capability now – we target Moscow as a city – or at least we did until that became beyond our reach with ABM defences! Does Polaris deter? Polaris/Chevaline? They don’t hit the bunkers which exist now.”¹¹⁹

The draft was amended. There is a less critical comment on the second version.

“This is much better but paras 4 and 5 are still difficult to follow. Should we not make clear (at the risk of repeating myself)

- a. Our present criterion is to attack Moscow as a city.
- b. For the future something better (Option 1) would offer surest deterrence but Option 2 (better than we currently do) or Option 3a (10 cities) would we believe deter.
- c. We cannot now choose the targeting option for 16 years hence. Our aim should be to buy

¹¹⁵ The Future of the UK Nuclear Deterrent, A Commentary, by the Defence Policy Staff for the Chiefs of Staff Committee, 13 August 1975, para 15, DEFE 25-335 e97 and DEFE 23-220 e54

¹¹⁶ DEFE 25-434 e36 October 1979

¹¹⁷ DEFE 25-434 e70 The successor to Polaris, Note by the Secretary of State for Defence, draft from Michael Quinlan, 29 October 1979

¹¹⁸ DEFE 25-434 e56 and e58 Future of the Strategic Deterrent, Draft minute to the Prime Minister from the Chairman of NM, October 1979

¹¹⁹ Successor Systems, letter from Michael Quinlan, 22 October 1979, DEFE 23-221 e35. Handwritten comment from R for PUS. Comparison with other documents (eg DEFE 23-221 e15-1) suggests that R is Richard Mottram, Private Secretary to the Permanent Under Secretary at the MOD.

flexibility.

d. On this argument – and cost and risk – C4 MIRV is best”.¹²⁰

A few days later, Mottram complained about another paper in which the wording on damage criteria was deliberately unclear.

“PUS, I tried to suggest to DUS(P) that para 3 was very misleading but the game now appears to be to blur all distinctions. Dear me !”¹²¹

On 1 November 1979 Francis Pym, the Defence Minister, wrote to Mrs Thatcher -

“I believe that a force capable of threatening Soviet central government would have on any Soviet leadership a more certain effect than one that is limited to threatening centres of population”.¹²²

A draft of the speech Pym was to present to MISC 7 indicates how he approached this issue. He stressed the importance of being able to threaten Moscow, and then added,

“The extent to which we should and could engage the leadership’s hardened wartime shelters is a more open question – there is nothing to stop them increasing the number, dispersal and hardness of these bunkers – but a MIRV system would at least give use some capability to attack bunkers and the Soviets would never be sure whether we knew which ones the leadership would use”.¹²³

This suggests that Pym did not regard the requirement to be able to attack the command bunkers as an absolute, in comparison with the emphasis on Moscow itself. Trident C4 would provide a capability to attack some command bunkers, even if it was not possible to destroy all the targets listed in Option 1. There was an underlying concern that the Soviet Union might in future provide even greater protection for their leadership. This concern reappeared in later deliberations on how many missile tubes would be required on submarines armed with Trident D5.

In contrast with the comments from Mottram, that there was too much emphasis on Option 1, the Chief of Naval Staff later said that “Moscow plus hardened bunkers” was not the working assumption when the C4 decision was made.¹²⁴ Ron Mason wrote, “In considering the Duff-Mason report, Ministers did not specifically address the adequacy in deterrent terms of the various criteria postulated.”¹²⁵ This suggests that, while the MISC 7 meeting on 5 December 1979 made the decision to opt for Trident C4, they did not give a clear indication of what the future damage criteria should be.

Four or five submarines for Trident C4

¹²⁰ The Successor to Polaris, letter from Michael Quinlan, 29 October 1979, DEFE 23-221 e47. Handwritten comment from R (Richard Mottram) to PUS. The text of paragraph 4 and part of paragraph 5 in the paper have been redacted.

¹²¹ DEFE 23-221 e53 The successor to Polaris, from PS/SofS to DUS(P), 31 October 1979. Para 3 is redacted from the attached paper.

¹²² The Successor to Polaris, Letter from Francis Pym to Margaret Thatcher, 1 November 1979, DEFE 25-434 e80-1

¹²³ DEFE 13-752 e1 Speaking note for Secretary of State for MISC 7 meeting on 5 November 1979. The cover note is wrongly dated 1 November 1970 and the document was placed in the wrong folder.

¹²⁴ AIR8-2846 e66 British Strategic Nuclear Targeting Policy, Assistant Secretary CNS, 21 October 1981

¹²⁵ AIR 8-2846 e1 Trident – Submarine and missile programmes, CSA, 9 July 1981

One key issue was how many submarines would be required. AWRE calculated that 27 or 28 C4 missiles would have to be launched to meet damage Option 1.¹²⁶ This would require two submarines on patrol, and a fleet of five submarines.¹²⁷

The original Duff-Mason report said that Option 2 (Moscow, Leningrad and two other cities) could be met with only one boat at sea, armed with Trident C4.¹²⁸ The Commentary from the Defence Policy Staff, in August 1979, implied this option would require two on patrol – “a single boatload at sea would meet only Option 3a and below”.¹²⁹ However the September 1979 version of Part 3 of the Duff Mason report repeated the original approach, saying that (for Trident C4) only Option 1 required two boats at sea.¹³⁰

The Duff-Mason report, in both the original and revised versions, presented a case for having an extra submarine on patrol, in case one vessel was lost due to Soviet Anti Submarine Warfare (ASW) activity or it was unavailable following a major accident. This was balanced with another section in the report which said that having an extra boat available for deployment in a crisis, but not on patrol, could be adequate.¹³¹ In his presentation to MISC 7 Francis Pym said that five boats would be required to deal with future ASW developments and improved Soviet defences.¹³²

So, two arguments were presented for having five, rather than four, submarines. One was that five submarines were needed for Option 1. The second was that the extra submarine reduced the risk of a submarine being lost due to hostile ASW activity.

The revised version of the Duff-Mason report said:

“To meet in full Option 1 ... the minimum force required is 5 SSBNs, with 16 C4 (MIRV). This assured capability is lost if one boat at sea is lost, but the other damage criteria can still be met by the remaining boat”¹³³

On 30 October 1979 the Chief of Defence Staff wrote to the Secretary of State for Defence reaffirming their earlier recommendation, in August of the same year, that “a successor force consisting of five SSBNs, each armed with 16 Trident C4 MIRVed missiles, is the one best fitted to the UK’s needs”.¹³⁴ The following month Pym recommended to Thatcher that the government should procure five submarines armed with C4 missiles.¹³⁵ The 1 November draft of his presentation to MISC 7 repeats this.¹³⁶

¹²⁶ Air 8-2846 E51i

¹²⁷ DEFE69-406 e21 Duff Mason Report, Part 3 (revised version) 12 October 1979

¹²⁸ “[with a force of 5 SSBN] Even if one of the two boats on continuous patrol were lost to pre-emptive attack, options 2 or 3a could still be met” DEFE24-2122 e1 Duff Mason Report, Summary of Part 3 December 1978.

¹²⁹ The Future of the UK Nuclear Deterrent, A Commentary, by the Defence Policy Staff for the Chiefs of Staff Committee, 13 August 1975, para 29, DEFE 25-335 e97

¹³⁰ DEFE69-406 e21 Duff Mason Report, Part 3 (revised version) 12 October 1979

¹³¹ Duff Mason Report, Part 3 Annex D, The Choice between alternative strategic launch platforms, DEFE 25-335 e97 (1978) DEFE69-406 e21 (1979)

¹³² DEFE 13-752 e1

¹³³ DEFE69-406 e21 Duff Mason Report, Part 3 (revised version) 12 October 1979

¹³⁴ DEFE 25-434 e 75 Future of the UK deterrent, CDS, 30 October 1979

¹³⁵ The Successor to Polaris, Letter from Francis Pym to Margaret Thatcher, 1 November 1979, DEFE 25-434 e80-1

¹³⁶ DEFE 13-752 e1

However, at their meeting on 5 December 1979, MISC 7 agreed to defer the decision on four or five submarines.¹³⁷ In advance of the meeting, Michael Quinlan had drafted letters to exchange between the Prime Minister and President which referred to five boats. John Hampford of the Treasury objected saying that the letters should not specify the number of boats.¹³⁸ On 11 December 1979 Hampford wrote again to Quinlan rejecting the argument that the risk of a breakthrough in ASW technology was so great that it justified the additional cost of a fifth boat – “the bigger the force, the larger the white elephant”.¹³⁹

Between January and July 1980 there appears to have been a subtle shift from “five submarines with an option of four” to “four submarines with an option of five”. In March 1980, a paper on the construction of the new submarines assumed that ministers would order five.¹⁴⁰ The Treasury maintained their opposition to the construction of the fifth. On 15 June 1980 Geoffrey Howe, the Chancellor, wrote to Mrs Thatcher questioning the strength of the ASW case for the fifth boat.¹⁴¹

The Chiefs of Staff had different views. The Chief of Naval Staff was in favour of five. The Chief of General Staff felt that in better times there should be five, but money was tight and the Navy had managed with only four in the past. The Chief of Air Staff said the Navy could have five, so long as they paid for them. The Defence Staff assumed, in their overall budget plans, that there would only be four.¹⁴²

This uncertainty over the number of submarines was reflected in official correspondence between British and American officials over the details of the proposed order. The initial figures showed the cost of the missiles and equipment which would be required to support five submarines. These were adjusted, in a handwritten annex, to show the equivalent for a four submarine force.¹⁴³

On 2 June 1980 MISC 7 decided that negotiations with the US should proceed on the basis of four submarines, with the option of a fifth.¹⁴⁴ The decision on the fifth was deferred until 1982 or 1983.

“Her Majesty’s Government has decided that the operational requirement would best be met by purchase of the Trident I MIRV system from the United States The United Kingdom Trident force is initially planned as four submarines each carrying sixteen missiles”¹⁴⁵

Penetration aids for Trident C4

The MOD considered adding penetration aids to the Trident C4 system. This is one explanation for the uncertainty over whether four or five submarines were required to meet Option 2. One draft of the revised Duff-Mason report Part 3 described the damage criteria that could be met by four and

¹³⁷ Cabinet - Nuclear Defence Policy – Future of the United Kingdom Strategic Deterrent: the present position, not by the secretaries, MISC 7(80)1, 29 May 1980. CAB130-1129. The formal minute of the MISC 7 meeting on 5 December 1979 in CAB 130-1109 does not record what was decided.

¹³⁸ DEFE 69-768 e73

¹³⁹ DEFE 69-768 e74

¹⁴⁰ DEFE 24-2124 e21 Successor systems – building options.

¹⁴¹ DEFE 24-2124 e77 Polaris Successor, Geoffrey Howe to Margaret Thatcher, 15 June 1980.

¹⁴² DEFE 25-325 e1 The case for five SSBN, Item 1, Chiefs of Staff Committee 10 June 1980. The case for five submarines was presented in a report at DEFE 25-325 e12.

¹⁴³ DEFE 24-2124 e75 Sale of Trident C4 missiles and equipment to the United Kingdom, Point Paper

¹⁴⁴ CAB 130-1129 Nuclear Defence Policy. Annex A MISC 7(80) 1st meeting minutes, 2 June 1980.

¹⁴⁵ DEFE 24-2124 e 58-1 Successor to the United Kingdom Polaris system

five submarines, “each with 16 C4 MIRV missiles (fitted with a small number of exo-atmospheric decoys)”.¹⁴⁶ This section of the final report has been redacted.

The confidential minute attached to the original Polaris Sales Agreement excluded penetration aids. In November 1979 the MOD proposed that the agreement should be amended.

“It will be important that when we come to the small print of the agreement, we hold open the option if we can to purchase penetration aids should the US develop any.”¹⁴⁷

By August 1980 the deletion of “minus penetration aids” was one of the formal amendments which were proposed. The Strategic Systems Program Office (SSPO) in America had relevant information which they were prepared to share,—

“The initial meeting with SSPO certainly indicated that they intended to include some penetration aid data in their information package and this will assist the UK assessments”.¹⁴⁸

One US development was the Mk500 Manoeuvrable Reentry Vehicle, which was tested on a Trident C4 missile in 1977. There may have been other Penetration Aid work carried out as part of the Trident programme. A list of Interface Control Diagrams suggests that SSPO developed penetration aids to accompany the Mk5 Reentry Vehicle on the D5 missile.

While there was an interest in acquiring American penetration aids, Frank Cooper, Permanent Under Secretary of State at the MOD, was adamant that the UK should not embark on its own Chevaline-style modification of Trident C4.¹⁴⁹

At the first meeting of the Trident Group, on 6 August 1980, Ron Mason (Chief Scientific Adviser) said that further work was needed to define the calculations in the Duff-Mason report. He set up a sub-group to look at technical issues including “such questions as the number of warheads to be deployed and the use of penetration aids”.¹⁵⁰

The first meeting of this sub-group commissioned AWRE to carry out a study. This concluded that 27 Trident C4 missiles, in their current configuration, would be required to meet Option 1 and that making one change (ie penetration aids, improved accuracy or different attack tactics) would not bring the level down to 16 or less missiles. At their second meeting the sub-group asked AWRE to carry out a further study.

“It was accepted that the Option 1 criteria would probably not be met by a 4 boat force but asked AWRE to examine whether the simultaneous adoption of pen aids, CEP improvements

¹⁴⁶ DEFE25-434 e25 Duff Mason Report, Part 3 (revised version), 20 September 1979, for discussion at a meeting of the Nuclear Matters Working Party on 25 September 1979, page 20

¹⁴⁷ DEFE 69-768 e54 letter from JF Howe to Michael Quinlan, 28 November 1979

¹⁴⁸ DEFE 24-2125 e79 Trident: amendment to Polaris Sales Agreement, Dr RG Ridley, 4 August 1980.

¹⁴⁹ “I would have the greatest reservations about any proposals significantly to modify the MIRV capability as in US Trident. We chose the American road in part to avoid a risky and costly development programme. We should not let even a small programme of UK work in by the back door now” DEFE 24-2125 e78 Letter from Frank Cooper to Ron Mason, 28 July 1980

¹⁵⁰ DEFE 24-2125 e79 Trident Group, Minutes of meeting held on Wednesday 6th August 1980; The sub-group held its first meeting on 8 September 1980, DEFE 24-2125 e86.

and a targeting policy including attacks on ABM sites could reduce significantly the number of missiles required at sea.”¹⁵¹

This meeting also raised the prospect of varying the Option 1 criteria in order to bring in within the capacity of a four boat force armed with C4.¹⁵² The possibility of adjusting the criteria had been raised earlier, but had been resisted.

Key aspects of Soviet power

In May 1980 Michael Quinlan wrote a public statement which was to be released when the Trident decision was announced. His initial draft said that UK governments have always refused to declare their targeting policy and plans. On 9 June he circulated a letter, in which he said,

“The Secretary of State believes that it will not be feasible to stand publicly on so bland a refusal of discussion, and that something a little less unforthcoming, particularly on the potentially contentious issue of ‘city bashing’ will be required.”¹⁵³

Quinlan then added a sentence to his paper,

“The Government think it right now to make clear that their concept of deterrence does not rest upon threatening maximum loss of life among the population at large; it is concerned essentially with posing a potential threat to key aspects of Soviet state power”.¹⁵⁴

After consultation, Quinlan deleted the words “does not rest upon threatening maximum loss of life among the population at large”. The reason he gave for this was “the public concern which the difficult ethical issues of nuclear deterrence naturally attract”.¹⁵⁵

The paper was subsequently published as Defence Open Government Document 80/23, The Future United Kingdom Strategic Nuclear Deterrent Force. The phrase “key aspects of Soviet state power” was seen as a rare insight into the closed world of British nuclear planning.

In 2004 Quinlan wrote,

“The phrase was intended to imply targeting concepts which, while still countervalue and not promising to exempt cities or in particular Moscow, would not be exclusively or primarily directed at the destruction of cities. The impulse behind this was ethical, and reflected in some degree vigorous public debate in Britain on the moral tolerability of striking at populations. ... considerations of sparing populations that emerged in the 1980s are surely still prominent.”¹⁵⁶

He made a similar statement in a debate at the Royal United Services Institute:

“In the 1980 Trident Open Government document, we said that our idea was to hold under threat key aspects of Soviet state power, and I can tell you with a certain authority that that

¹⁵¹ DEFE 25-325 e57 Trident progress (CSA’s ad hoc nuclear technical policy working group), 19 November 1980

¹⁵² DEFE 25-325 e57 Trident progress (CSA’s ad hoc nuclear technical policy working group), 19 November 1980

¹⁵³ DEFE 24-2124 e71 Polaris successor memorandum, M Quinlan, 9 June 1980

¹⁵⁴ DEFE 24-2125 e71 Polaris successor memorandum, M Quinlan, 9 June 1980

¹⁵⁵ DEFE 24-2125 e1-6 Polaris successor memorandum, M Quinlan, 9 July 1980

¹⁵⁶ Quinlan in Getting MAD page 273.

was meant to convey not counter population, not counter city and that it was in there for ethical reasons.”¹⁵⁷

The evidence from the National Archives enables these comments to be seen in the light of the MoD's policy at the time. While “key aspects of Soviet state power” was introduced into the paper to signal a move away from targeting cities per se, it would be wrong to think that the UK stopped thinking about planning attacks on cities, including with Trident, in 1980. The decision to acquire Trident C4 was based on options 1, 2 and 3a in the Duff-Mason report. Attacks on cities continued to feature in discussions on the targeting of these missiles in the second half of 1980 and in 1981. According to AWRE's assessments, the fleet of four submarines with Trident C4 would only be able to carry out the counter-city attacks in options 2 and 3a and not the attack on command bunkers envisaged in option 1. Attacks on cities were still being considered in October 1981 when the Defence Policy Staff wrote a paper on the relative capabilities of C4 and D5 missiles. One comparison they made was between the numbers of C4 and D5 missiles required to “inflict the requisite level of severe structural damage to the city [Moscow]”.¹⁵⁸ They also listed the numbers of each type of missile required to meet options 1, 2 and 3a. This shows that it is inaccurate to interpret Quinlan's phrase in the Open Government document as the sign of an immediate change, in 1980, in the targeting policy that was to be adopted for Trident.

The Defence Policy Staff commentary on the Duff-Mason report, in August 1979, says that the UK could threaten “functions of key importance to the Soviet State” or cities or both.¹⁵⁹ In this context the “functions of key importance” referred to the command facilities in option 1. Frances Pym's distinction between Soviet government and centres of population is a further indication that “key aspects of Soviet power” was a reference to the command facilities around Moscow.¹⁶⁰

There is no evidence which suggests that the new focus on destroying command centre was based on ethics. At an early stage in the production of the Duff-Mason report, Clive Rose produced a series of arguments for and against Britain retaining nuclear weapons.¹⁶¹ The moral dimension of the debate was noticeably absent. The concept of attacking command centres was created because the Soviet Union was building facilities which would enable their political and military leadership to survive an attack which was aimed at destroying the city of Moscow per se.

As someone closely involved in the process, Quinlan would have been fully aware of the AWRE estimates which showed that twice as many warheads would be required for option 1 as for option 2. With the exception of Kuznetsk-8, the command centres in option 1 were all either in or around the city of Moscow. Attacking hardened bunkers meant moving from air-burst to surface-burst attacks. The MOD's Leningrad study had already shown that attacks of this sort could result in at least as many civilian casualties. Quinlan would have known that an attack on command centres

¹⁵⁷ Renewing Britain's Independent Strategic Nuclear Deterrent: A debate, RUSI.
<http://www.rusi.org/analysis/commentary/ref:C45F69446BEF2F/>

¹⁵⁸ AIR 8-2846 e47 UK strategic nuclear force – Chiefs of Staff advice, note by the Directors of Defence Policy, 2 October 1981.

¹⁵⁹ The Future of the UK Nuclear Deterrent, A Commentary, by the Defence Policy Staff for the Chiefs of Staff Committee, 13 August 1975, DEFE 25-335 e97(i). In this context the phrase “functions of key importance to the Soviet State” clearly refers to Option 1.

¹⁶⁰ The Successor to Polaris, Letter from Francis Pym to Margaret Thatcher, 1 November 1979, DEFE 25-434 e80-1

¹⁶¹ The Politico-Military requirement for a UK nuclear deterrent, 28 June 1978, DEFE 69-405 e23

would result in a similar scale of civilian casualties as a breakdown-level attack on the city. It would not in any sense spare the local population.

The origin of the phrase in the Open Government document is evident from Quinlan's letter of 9 June 1980. The concern, as in the whole of the Open Government document, was to present the expensive and contentious Trident decision in the best possible light.

Trident D5 decision

The Navy review of future options, 1977, noted that while the capabilities of D5 were not essential, the timescale for the newer missile was more suited to the UK programme. A year later the Duff-Mason report concluded that the additional range of the D5 missile was not required for UK purposes and that the extra cost would not be justified. Part 3 of the original report said "the US *will not* move to an inventory entirely based on large missiles in large submarines".¹⁶² The revised version of Part 3, written in *August 1979*, was less certain, "the US *is unlikely* to move to an entirely Ohio force".¹⁶³

When President Carter formally agreed to provide Trident C4, in July 1980, the assumption had been that the US government would not make a decision on its D5 programme until late 1982 or 1983. In November 1980 Ronald Reagan was elected President and the new US administration considered adopting D5 more quickly. In the first half of 1981, as the MOD worked on their plans for C4, they also consider the implications of a switch to D5. One possibility was that the British submarines might initially be armed with C4 and then later adapted for D5 in a mid-life upgrade. On 9 July 1981 Mason wrote a briefing for Defence Minister John Nott in which he presented the case for a switch to D5 from the start. The new submarines should have 16 D5 tubes, even though the intention was to arm them initially with only 12 missiles. Nott was a keen advocate of moving to D5.

On 24 August Casper Weinberger, US Defence Secretary, informed Thatcher that Reagan was about to announce the go-ahead for D5. The proposal that Britain might adopt the larger and more expensive missile came at a time when the government were making drastic cuts to the defence budget. Despite this, the Chiefs of Staff endorsed the move to D5.

The number of warheads on each of the 12 missiles per submarine was limited to 10, from a potential maximum of 14, because AWRE would have been unable to produce a larger number of warheads.¹⁶⁴

The MISC 7 committee discussed the plan on 24 November 1981, but they deferred their decision to a second meeting, on 12 January 1982 when they agreed to adopt D5.

There had been opposition to Trident, not just amongst the public, but also within the Conservative Party and Cabinet. On 10 February 1981 Nott had told Thatcher that he supported the new system even though, "two-thirds of the Party and two-thirds of the Cabinet were opposed to the procurement of Trident. Even the Chiefs of Staff were not unanimous."¹⁶⁵ Lord Carrington, Foreign

¹⁶² DEFE 24-2122 e1 Duff Mason report Part 3 page 10, December 1978

¹⁶³ DEFE68-406 Duff Mason report Part 3 page 10 August 1979.

¹⁶⁴ AIR 8-2846 e47ii para 5c

¹⁶⁵ PREM 19-417 Minute of a meeting between the Prime Minister, Defence Minister and Foreign Secretary, 10 February 1981.

Minister, argued “Failure to acquire Trident would have left the French as the only nuclear power in Europe. This would be intolerable.”¹⁶⁶

A major concern at the MISC 7 meetings was the cost of the D5 system. The sceptics included the Foreign Minister,

“Lord Carrington ... still has a lingering hope that a cheaper way might be found and thinks that the Ministry of Defence is guilty of gold-plating”.¹⁶⁷

Geoffrey Howe, Chancellor, argued that the new boats should have only 12 missile tubes, but the committee as a whole decided there should be 16. They did not seriously consider the earlier option of building five submarines. The main proposal was to have four boats. A new alternative, having only three submarines, was raised. The January 1982 MISC 7 meeting deferred the final decision on the number of vessels.

Trident D5 capability and damage criteria

The arguments Mason had presented to Nott on 9 July 1981 were repeated in a Defence Policy Staff (DPS) report and in the initial draft of the Chiefs of Staff advice to the MISC 7 meeting in November 1981. Brigadier AW Dennis, Acting Assistant Chief of Defence Staff (Policy), circulated this first version of this advice. The Chiefs of Staff then made substantial amendments to it.

Admiral Sir Henry Leach (Chief of Naval Staff), in a revised version of the advice, prioritised the various arguments for moving to D5. He said the case for the more advanced missile was “primarily on the grounds of commonality with the USN system”.¹⁶⁸ The potential to cope with future improvements to the Moscow ABM system were “of less importance”. D5’s ability to destroy hardened targets was a third consideration.

Nott stressed the commonality argument in his closing remarks to the MISC 7 meeting in January 1982. He said “US D5 decision has effectively closed off the option for us to remain with C4” and “the original Trident C4 plan to which we had already agreed, is now a dead letter because of the American decision to bring their D5 system into service early, in 1989”.¹⁶⁹ He described the improved operational capability of D5 over C4 as “a valuable but incidental advantage.”¹⁷⁰

Part of Mason’s original argument for D5, in his submission to Nott in July 1981, was based on the damage criteria in the report he had produced, along with Antony Duff, in 1978. Mason noted that, in their earlier MISC 7 meetings, ministers had not specifically addressed the various criteria options in the Duff-Mason report. However, he pointed out that the Chiefs of Staff had done so and had ranked them in order, with Option 1 being the most adequate deterrent.

Mason argued that the government should move to D5 because, unlike C4, it was effective against the hardened targets identified in Option 1 of the Duff-Mason report.¹⁷¹ He said that one boat with C4 missiles could not carry out this type of attack if faced with only 32 ABMs. However, one boat

¹⁶⁶ PREM 19-417 Minute of a meeting between the Prime Minister, Defence Minister and Foreign Secretary, 10 February 1981.

¹⁶⁷ DEFE 24-2123 e 6-14 MISC 7, Frank Cooper, 20 November 1981

¹⁶⁸ AIR 8-2846 e60 The future of the UK strategic nuclear deterrent, secretary CNS, 13 October 1981

¹⁶⁹ DEFE 24-2123 e6 MISC 7 - opening remarks – points to make

¹⁷⁰ DEFE 24-2123 e80 MISC 7 presentations – concluding remarks by the secretary of state,

¹⁷¹ AIR 8-2846 e1 Trident – Submarine and missile programmes, CSA, 9 July 1981

with 12 D5 missiles would be effective against these targets even when there were 100 ABMs. Two boats, with 12 D5 missiles each, would be able to carry out Option 1 if the number of ABMs increased to 300.

Mason also said that two boats with C4 would have to be at sea to meet Option 2 and that the most demanding of the options which one boat with C4 could achieve was Option 3a, which excluded Moscow. The Chiefs of Staff Commentary on the Duff-Mason report had made the same points, in 1979.

The DPS followed Mason's approach in their report on 2 October 1981. One question they sought to answer was "Is D5 operationally better suited to our needs?"¹⁷² Their first comparison was based, not on the Duff-Mason options, but on inflicting "the requisite level of severe structural damage" to the city of Moscow. They described Moscow as "the Group 1 target". To penetrate 100 ABMs and inflict this level of damage would require a force of twelve C4 missiles, whereas only seven or eight D5 missiles would have the same effect.¹⁷³

In their second comparison, the DPS report looked at the ability of C4 and D5 missiles to achieve Option 1. They argued that, "meeting Duff/Mason Option 1 is beyond the competence of C4".¹⁷⁴ They repeated Mason's statement about the effectiveness, for Option 1, of one and two boatloads of D5 against 100 and 300 ABM respectively.

The DPS report revealed that, "against bunkers, some four or more C4 detonations would be needed as substitute for a single D5 burst." This was their reason for dismissing the possibility that C4 could achieve Option 1. D5 was more accurate than C4, as measured by Circular Error of Probability (CEP). It had, "a substantially reduced CEP giving D5 the capability to penetrate most hardened targets with a single burst". The newer missile had "far greater potential against hardened targets notably command bunkers". In addition, the report argued that D5 would also be effective against nuclear weapon ready-issue stores, oil depots and oil pumping stations. D5 was "a more potent weapons system". It would provide "deterrence of a higher order."¹⁷⁵

Dennis's initial draft of the advice to MISC 7 stressed the importance of having the capability to destroy hardened targets:

"We ... believe that the best insurance against the possibility of a major war, and our defeat in it, lies in our possessing a strategic nuclear deterrent, and such a deterrent must have a high probability of destroying defended and hardened targets 30 or 40 years hence if it is to be credible".¹⁷⁶

¹⁷² AIR 8-2846 e47i US strategic nuclear force – Chiefs of Staff advice, Note by the Directors of Defence Policy, 2 October 1981

¹⁷³ 12 C4 missiles with 8 warheads each would carry a total of 96 warheads. 7 D5 missiles with 14 warheads each would carry a total of 98 warheads.

¹⁷⁴ AIR 8-2846 e47i US strategic nuclear force – Chiefs of Staff advice, Note by the Directors of Defence Policy, 2 October 1981

¹⁷⁵ AIR 8-2846 e47i US strategic nuclear force – Chiefs of Staff advice, Note by the Directors of Defence Policy, 2 October 1981

¹⁷⁶ AIR8-2846 e47i Draft Chiefs of Staff advice to the Secretary of State on UK strategic nuclear forces, 2 October 1981

The Air Staff underlined the word “must” in their copy of this draft, probably because they questioned this approach. Admiral Sir Henry Leach, Chief of Naval Staff, removed the reference to defended and hardened targets and his amendment was agreed.¹⁷⁷

The initial draft also referred to “the benefits of D5’s greater accuracy, which allows for bunkers and hardened targets to be destroyed by a single burst, in place of about four C4 detonations” and to the newer missiles advantage in “sustaining a long term capability to hit key targets”.¹⁷⁸ Leach’s revised version replaced this with “D5 has an increased operational capability should we wish to attack discrete or hardened targets”.¹⁷⁹ This was further amended to, “which would allow us to threaten discrete or hardened targets”.

The early draft had stressed the weakness of C4, but Leach’s revision argued that this missile still met the basic criteria,

“in purely operational terms C4 meets our current deterrent criteria although we recognise that this view is very dependent upon assumptions which could be substantially altered by revised intelligence assessments.”¹⁸⁰

Nott repeated this, in his presentation to MISC 7 in November 1981. He said, “on present assessments C4 would be sufficient for our deterrent needs.”¹⁸¹

There may have been an underlying difference between Mason and Leach in how they interpreted the damage criteria. Leach’s amendments to the MISC 7 advice and to the strategic targeting policy suggest that his main concern was that the UK should be able to mount an effective attack on Moscow. In contrast, Mason focused on Option 1 in the Duff-Mason report, with its emphasis on attacking hardened command bunkers, including those outside the city.

There are repeated references, in these documents, to long-term concerns that Russia could deploy more ABMs than were permitted in the ABM Treaty, and that they could build more hardened command bunkers.

In November 1979, the draft of Pym’s presentation to MISC 7 flagged up the possibility that Russia could increase the number, dispersal and hardness of their command bunkers.¹⁸² On 30 July 1980, only two weeks after Carter agreed to provide C4, Simon Webb (DS17) wrote a briefing, for Mason, which took a pessimistic look at some potential developments. Two ‘what if’ scenarios were Russia deploying several hundred ABM and a dramatic breakthrough in submarine detection. There was a third scenario, but it has been redacted. This additional concern is likely to have been an increase in

¹⁷⁷ AIR 8-2846 e55 Proposed amendments to draft Chiefs of Staff advice to Secretary of State, Secretary Chief of Naval Staff, 7 October 1981.

¹⁷⁸ AIR 8-2846 e47i Draft Chiefs of Staff advice to the Secretary of State on UK strategic nuclear forces, 2 October 1981

¹⁷⁹ AIR 8-2846 e60ii Draft Chiefs of Staff advice to the Secretary of State on UK strategic nuclear forces, Secretary CNS, 13 October 1981

¹⁸⁰ AIR 8-2846 e60ii Draft Chiefs of Staff advice to the Secretary of State on UK strategic nuclear forces, Secretary CNS, 13 October 1981

¹⁸¹ AIR 8-2846 e70i United Kingdom Strategic Deterrent (Note by Secretary of State for Defence), 2 November 1981

¹⁸² DEFE 13-752 e1 Speaking note for Secretary of State for MISC 7 meeting on 5 November 1979. The cover note is wrongly dated 1 November 1970 and the document was placed in the wrong folder.

the hardening of Russian Command bunkers.¹⁸³ One of the measures Webb proposed as a response to these concerns was that the MOD might acquire the D5 missile rather than C4.

In his July 1981 paper, Mason used these concerns, about the potential for improved ABM defences and increased hardening of targets, to argue for a 16-tube submarine, even though 12-tubes would meet the initial requirement.¹⁸⁴ In his presentation to MISC 7 in November 1981, Nott argued that 16-tubes would provide flexibility in the event of ABM improvements.¹⁸⁵

The arguments about increased ABM defences and greater hardening of bunkers were also used in general support of the move to D5. In his presentation to the January 1982 meeting, Nott said,

“D5 will be superior in operational terms to the C4 system. This is a valuable but incidental advantage and whilst not necessary against the present ABM defence threat and most target options, it provides a robust hedge against Soviet improvements in both these aspects over the next 30 to 40 years.”¹⁸⁶

There were similar statements in the DPS report of 2 October 1981, Leach’s revision of the MISC 7 advice and the presentation from Admiral Lord Lewin, Chief of Defence Staff, to the January 1982 MISC 7 meeting.¹⁸⁷

One critic of the rush to adopt D5 was Group Captain Miller in the Air Department. He advised Air Chief Marshal Sir Michael Beetham, Chief of Air Staff, that the D5 proposal was “a call for maximum insurance against ABM defences as yet unspecified” and said “there is no justification for the operational requirement against our current national targeting plans.”¹⁸⁸

Limited Nuclear Options and Long Range Theatre Nuclear Forces

A draft for the Duff-Mason report, in May 1978, described how the US and NATO had moved away from massive retaliation because this had become increasingly incredible as a response to anything other than a Soviet attack on cities in the United States,

¹⁸³ DEFE 24-2125 e76-3 page 3. The countermeasures of increasing warhead yield and/or accuracy suggest that the third concern was that Russia could build even deeper bunkers.

¹⁸⁴ “In terms of deterrence criteria alone, a 12-tube D5 force would be more than sufficient to meet the most exacting of the requirements so far considered by Ministers. But it must be remembered that we are considering a force which will be operating to the year 2020 at least, and we cannot predict what improvements in defensive capabilities, either in terms of ABMs or increased hardening of targets, the Soviets will make in that time” AIR 8-2846 e1 Trident – Submarine and missile programmes, CSA, 9 July 1981

¹⁸⁵ “Although with D5 we should be unlikely, initially at least, to want to fill all the tubes, the larger number will, with little impact on the total cost, give us flexibility to cope with the possibility of improved Soviet anti-ballistic missile defences” AIR 8-2846 e70i United Kingdom Strategic Deterrent (Note by Secretary of State for Defence), 2 November 1981

¹⁸⁶ DEFE 24-2123 e80 MISC 7 presentations – concluding remarks by the secretary of state,

¹⁸⁷ “This clearly argues on operational grounds the advantage of D5 over C4 in offering a distinctly wider margin of insurance to meet potential Russian developments in the 21st century.” AIR 8-2846 e47i Draft Chiefs of Staff advice to the Secretary of State on UK strategic nuclear forces, 2 October 1981; D5 would provide “a robust insurance against future Soviet developments.” AIR 8-2846 e60ii Draft Chiefs of Staff advice to the Secretary of State on UK strategic nuclear forces, Secretary CNS, 13 October 1981; The UK should acquire D5 in order to “meet our present deterrent criteria and to provide good insurance against improvements to Soviet defences.” DEFE 24-2123 e59 draft speaking note for CDS for MISC 7 meeting in January 1982, 31 December 1981.

¹⁸⁸ AIR 8-2846 e49i MISC 7 Chiefs of Staff submission, Group Captain Miller, 6 October 1981

“in recent years increased emphasis in US and NATO doctrine has been placed on the need for flexibility in the targeting of strategic forces; and Limited Nuclear Options (LNOs) of selective strikes on military and industrial targets have been developed as possible alternatives to the ultimate option of massive strikes on population centres.”¹⁸⁹

Dr Schlesinger introduced LNOs into US policy in 1974. The new options were to provide responses to any limited Soviet attack on targets in the US and a means of controlled escalation, beyond the use of tactical nuclear weapons, in Europe.¹⁹⁰

In the 1980s, America deployed Ground Launched Cruise Missiles (GLCM) and Pershing II to Europe, as Long Range Theatre Nuclear Forces (LRTNF). LRTNF were to provide a bridge between tactical and strategic nuclear strikes.

Prior to this, NATO’s LRTNF had consisted of British Vulcan bombers, US F111 aircraft, Poseidon missiles on US submarines and Polaris missiles on British submarines. The V-bombers were due to be retired in 1982/3 and the F111 a few years later.

Several factors led the US to convince its NATO allies of the need for new LRTNF. One was the Soviet Union’s deployment of SS-20 missiles. Another was the loss of the F111 and V-bombers. A third consideration was that Poseidon and Polaris missiles were not suitable for limited nuclear strikes, because the Soviet Union was likely to regard them as strategic nuclear forces.

The issues of LNOs and LRTNF were related. An MOD study said that NATO LRTNF were “primarily required for Selective Employment rather than General Nuclear Response”.¹⁹¹

The Criteria for Deterrence committee (the Duff Group) discussed LNOs in March 1978. The minute of this meeting says,

“A threat of massive retaliation against Soviet cities would be likely credibly to deter only Russian nuclear attacks against British cities”.¹⁹²

Following the US initiative in 1974, NATO developed LNOs. The MOD produced LNOs for Vulcan bombers as part of these coordinated NATO targeting plans.¹⁹³ But, by March 1978, the UK still had no LNO doctrine for forces operating in a national role.¹⁹⁴ The Defence Policy Staff produced a report on this, DP16/78, which the Chiefs of Staff discussed on 19 December 1978.¹⁹⁵ The term used in the report was Sub Strategic Nuclear Options (SSNOs), but the concept was similar to LNOs. The Chiefs of Staff suggested changing the term to Extended Theatre Nuclear Options. The phrase Sub-Strategic was potentially misleading. The focus was on strikes that were strategic, but short of the simultaneous release of all UK strategic nuclear forces.

Admiral Lord Lewin, Chief of Naval Staff, sought to amend DP16/78. He reworded one sentence to say:

¹⁸⁹ DEFE 23-291 e50 Criteria for Deterrence, Richard Mottram, 25 May 1978; This argument was presented in Part I of the Duff-Mason report, but only with regard to US policy and without the term Limited Nuclear Options.

¹⁹⁰ DEFE 69-769 e47 US Strategic targeting policy, Simon Webb, 9 August 1980

¹⁹¹ DEFE 25-335 e64 A study of a possible new UK contribution to a NATO Long Range Theatre Nuclear Force, Defence Policy Staff, DP10/79, 19 June 1979.

¹⁹² DEFE 68-405 e9 Criteria for Deterrence, Note of a meeting on 22 March 1978.

¹⁹³ Michael Quinlan speaking in a seminar on the RAF and nuclear weapons 1960-1998, RAF Historical Society, Journal 26.

¹⁹⁴ DEFE 68-405 e9 Criteria for Deterrence, Note of a meeting on 22 March 1978..

¹⁹⁵ DEFE 25-433 e27 Confidential Annex to COS 22nd meeting, 19 December 1978.

“In circumstances where Allied deterrence has broken down and the Soviets threaten action against the UK for which the use of our national ultimate strategic capability may be considered too escalatory, Ministers might at very short notice require the Chiefs of Staff to present them with Sub Strategic Nuclear Options.”¹⁹⁶

This was agreed by the Chiefs of Staff.

In a second amendment, Lewin proposed,

“Polaris should not be considered as a delivery system for SSNOs unless 3 boats are deployed.”¹⁹⁷

The other Chiefs of Staff did not accept Lewin’s wording. However, the minute of their meeting says that one of the key points made in the discussion was,

“Should three SSBNs be on station, Polaris could contribute to this role as a delivery system for SSNO, however the use of ballistic missiles could be misconstrued as a precursor to a strategic strike.”¹⁹⁸

This suggests that the Navy’s approach was that the MOD should only allocate SSNOs to the third Polaris submarine, when it was available. The refit cycle meant that for 20% of the time the third submarine was not operational. In addition, any allocation of SSNOs to Polaris was questionable, because a limited attack from a nuclear submarine might be misinterpreted.

The Chiefs of Staff agreed that SSNOs should be prepared. These targeting options were allocated to Vulcan bombers.¹⁹⁹ The Chiefs also concluded that there was “no case for developing dedicated forces” for SSNOs.²⁰⁰

In May 1979, DPS produced a report on a UK contribution to NATO LRTNF (DP10/79). There were two basic responses to the report. One was that the UK should continue with the current arrangement, where forces primarily assigned to UK strategic nuclear forces (Polaris and the Vulcan bombers) could also contribute to NATO LRTNF. The second was that the UK should acquire an additional nuclear force that was specifically allocated to the NATO LRTNF role. In their initial discussion, in March 1978, the Duff Group had adopted the first position.

Quinlan supported a UK LRTNF, and described why it was needed,

“there are many things they could do to us which would be too severe for (say) a Tornado strike on Poland to be an adequate response but not severe enough for a Polaris strike on Moscow (bringing annihilation upon us)”.²⁰¹

Air Chief Marshall Neil Cameron, Chief of Defence Staff, was in favour of a modest new LRTNF, as a replacement for the Vulcan bombers. One summary of his views says, “Independent series of options for UK nationally” and “Polaris won’t really do”.²⁰²

¹⁹⁶ DEFE 25-433 e26 Sub Strategic Nuclear Options, Secretary CNS, 19 December 1978.

¹⁹⁷ DEFE 25-433 e26 Sub Strategic Nuclear Options, Secretary CNS, 19 December 1978.

¹⁹⁸ DEFE 25-433 e27 Confidential Annex to COS 22nd meeting, 19 December 1978

¹⁹⁹ The British Experience, Michael Quinlan, in Getting MAD, Nuclear Mutual Assured Destruction, its origin and practice. Henry D Sokolski (ED), Strategic Studies Institute, 2004

²⁰⁰ DEFE 25-433 e27 Confidential Annex to COS 22nd meeting, 19 December 1978.

²⁰¹ DEFE25-335 E69 Long Range Theatre Nuclear Forces, CNS, 25/6/79

²⁰² DEFE 25-335 e70

In a letter to Ron Mason (MOD Chief Scientific Adviser), Cameron pointed out the weaknesses of assigning the LRTNF role to Polaris. He said that American submarines, armed with Poseidon, were “too remote and too much the product of a national deterrent concept, to be fully credible as Alliance theatre systems”. Cameron said this criticism was even more valid when applied to the far smaller UK Polaris force. Polaris was “an unsatisfactory system as the UK’s sole contribution to NATO’s theatre nuclear forces.”²⁰³ The UK would not commit this last-resort force to carrying out limited nuclear strikes.

In reply, Mason said he was not convinced that the UK needed a wide range of nuclear capabilities, particularly in the light of budget constraints.²⁰⁴ He referred to the possibility of having two Polaris submarines on patrol, one in a strategic role and the other in a theatre role, although the Navy could not sustain this continuously. Mason suggested that the successor to Polaris would be more flexible and more suited to a LRTNF role.

DP10/79 explained the problems of relying on Submarine Launched Ballistic Missiles (SLBM),

“present SLBMs are unsatisfactory as the sole long range theatre systems for some selective functions because of their low accuracy and higher yields, and their perceived association with a strategic exchange rather than any earlier stage of escalation.”²⁰⁵

The Soviet Union might misinterpret a limited strike from Polaris as a full-scale attack. DP10/79 pointed out that “SLBM flight profile and high weapon yields could result in their use being misinterpreted as part of a strategic attack.”²⁰⁶

A limited attack from a Polaris submarine would compromise the vessel’s location and leave it vulnerable to a counterattack,

“the firing of only a few missiles in this role would expose their parent SSBNs to a much greater risk of detection and possible attack, reducing their survivability as a strategic system”.²⁰⁷

DP10/79 recommended that the UK should acquire a specific new LRTNF capability and that this should take the form of American GLCM with British warheads.²⁰⁸ The Chiefs of Staff discussed the report on 26 June 1979, but did not accept its recommendations. While Cameron supported the proposal, the other Chiefs felt that it was not essential for the UK to have a new capability. They argued that this was a lower priority than the replacement of Polaris and WE177. AWRE lacked the facilities to build the additional warheads required. The Chiefs also had different views on what would be the best system to adopt if they were to acquire a new LRTNF capability.

In his submission to Nott, Cameron explained his colleagues’ views,

²⁰³ DEFE 25-433 e56 Neil Cameron to Ron Mason, 24 May 1979.

²⁰⁴ DEFE 25-433 e82 Ron Mason to Neil Cameron, 21 June 1979

²⁰⁵ DEFE 25-335 e64 A study of a possible new UK contribution to a NATO Long Range Theatre Nuclear Force, Defence Policy Staff, DP10/79, 19 June 1979.

²⁰⁶ DEFE 25-335 e64 A study of a possible new UK contribution to a NATO Long Range Theatre Nuclear Force, Defence Policy Staff, DP10/79, 19 June 1979.

²⁰⁷ DEFE 25-335 e64 A study of a possible new UK contribution to a NATO Long Range Theatre Nuclear Force, Defence Policy Staff, DP10/79, 19 June 1979.

²⁰⁸ DEFE 25-335 e64 DP10/79 Annex B Draft submission to Secretary of State, 19 June 1979.

“They would not wish to change the prime roles of the Polaris and Tornado forces but stress that both have a very significant long range theatre capability which might be used in extremis and, probably more important, both NATO and the Warsaw Pact must recognise this to be the case”.²⁰⁹

On 19 September 1979 the MISC 7 committee deferred a decision on acquiring a UK LRTNF, while agreeing to the deployment of American GLCM to Britain.

The issue of LNOs reappeared, in 1981, during discussions on a new strategic nuclear targeting policy.

Review of strategic nuclear targeting policy (1981)

Between March and September 1981, DPS carried out a study into national strategic nuclear targeting options. By 11 September, they had circulated a second draft of their report, DP11/81.²¹⁰ The Navy Department’s response was “head-on opposition” to the DPS report. The Air Department were lukewarm and the Army were uncertain. Michael Quinlan fully supported the new approach.²¹¹

The Chiefs of Staff Committee discussed DP11/81 on 7 October 1981. In addition, the Deputy Chief of Defence Staff (Intelligence) (DCDS(I)) gave them a briefing on strategic nuclear targeting. Following this meeting, the secretary of the committee drafted a submission to John Nott, the Secretary of State. He circulated this around the Chiefs of Staff, as a Confidential Annex to the minutes.

Air Chief Marshal Sir Michael Beetham (Chief of Air Staff) and Field Marshall Sir Edwin Bramall (Chief of General Staff) argued that there was a need for limited strategic nuclear strike options. In doing so, they were almost certainly backing what was in the DPS report. In contrast, Admiral Sir Henry Leach (Chief of Naval Staff) said that there should be a “single target list” and a “one-button-push”.²¹² His view was that all strategic nuclear forces should be launched simultaneously against one list of targets.

Leach argued that the committee should not send the DPS report or the submission, in its initial form, to Nott. He wrote his own version of a submission to the Secretary of State and circulated it round his colleagues. Admiral Lord Lewin (Chief of Defence Staff) felt that Leach’s paper did not reflect the overall views of the committee and so he produced a third draft himself. The committee discussed this on 26 October. While the outcome of this meeting is not certain, it is likely that the committee submitted the third draft, along with the original DPS paper, to Nott.²¹³

The Chiefs of Staff agreed that the primary focus should be targeting Moscow. At the committee meeting on 7 October, “both the presentation and discussion confirmed that Moscow was the core

²⁰⁹ DEFE 25-335 e69 (i) UK contribution to a NATO long range theatre nuclear force (LRNTF), Secretary Chiefs of Staff Committee, 25 June 1979.

²¹⁰ Most of the information on the targeting review comes from AIR 8-2846. This file includes documents related to the review, but the MOD has not released DP11/81 or the draft submissions to John Nott. The draft submissions were 3 or 4 page documents.

²¹¹ “The nuclear targeting paper (second draft) has met with a mixed reception: head-on opposition from ND, lukewarm approval from AFD, ‘uncertainty’ from AD, DUS(P) fully supports the paper” DEFE25-435 e50 Nuclear BUTD Summary of present position, SCDS, 11 September 1981.

²¹² AIR8-2846 e67ii

²¹³ Leach, Beetham and Lewis all wrote notes following the 26 October meeting in which they rejected Leach’s suggestion that the DPS report should not be sent to Nott.

of the UK deterrent posture.” At the subsequent meeting, Beetham was due to say, “Moscow must remain our core criterion”.²¹⁴ Leach’s view was that the city should be at the top of his single list.²¹⁵

Group Captain Miller, in a briefing for Beetham before the 26 October meeting, wrote,

“With the improved accuracy of the new system we should plan to attack specific key areas rather than built up areas as a whole.”

It is likely that this statement reflected the proposals from DPS and DCDS(I).

The presentation from DCDS(I) to the committee on 7 October included the following items:

- “c. Filtering the target list
 - (1) Categories rejected
 - (2) Target groupings
 - (a) Military
 - (b) Industrial and Economic
 - (c) Administrative and Control”²¹⁶

This can be compared to the annex to Part II of the Duff Mason report (1978) which has four headings: (1) Governmental capability, (2) Military facilities, (3) Military research, development and production, and (4) Generalised destruction.²¹⁷ The section on Generalised destruction defined breakdown-level damage to urban areas. The omission of this from the DCDS(I) presentation suggests that the briefing advocated a move away from targeting cities, per se, to targeting specific facilities. Quinlan had flagged up this change in the Open Government document published in July 1980.

An amendment from Bramall to Leach’s draft submission proposed that the wording in paragraph 4 should be changed to “would provide the capability to destroy such targets with a single warhead and this would require only one boatload.”²¹⁸ This would appear to be a reference to carrying out Duff-Mason Option 1 from one submarine armed with D5 missiles. The MOD had calculated that, with the D5 missile, a single warhead could destroy a hardened bunker.

Paragraph 4 in Lewin’s final version of the submission also referred to targeting bunkers. Leach suggested a change of wording and his amendment refers to “Moscow plus hardened bunkers”. Bramall sought to change “embedded in cities” to “within city limits” in the same paragraph. This was probably a reference to the fact that some of the specific targets, including bunkers, were within cities.

The presentation from DCDS(I) covered command bunkers. It included the following items:

- “g. Problems thrown up
 - (1) Soviet bunkers
 - (2) ABM defences
 - (3) Further studies required
 - (a) Use of RAF assets

²¹⁴ AIR 8-2846 e67ii Brief for Chief of Air Staff for presentation to SofS on strategic nuclear targeting, Group Captain Miller, 23 October 1981

²¹⁵ AIR 8-2846 e53

²¹⁶ AIR8-2846 e48 Outline of presentation on strategic nuclear targeting

²¹⁷ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

²¹⁸ AIR 8-2846 e63 British strategic nuclear targeting, MA to CGS, 16 October 1981.

- (b) Fallout policy
- (c) Multiple Bursts – Fratricide Cumulation”

In addition to the specific reference to bunkers, fallout and fratricide were significant issues in planning attacks on underground command centres. A nuclear warhead is more effective against a hardened bunker if it is detonated as a surface-burst, but this produces more radioactive fallout. A multiple burst approach, targeting several warheads on one target, can be used to increase the probability of destroying a specific target and is particularly used, in American nuclear planning, against hardened targets, including command bunkers. Russian ABM defences protected both the city of Moscow and underground command centres in the surrounding area.

A significant aspect of the new policy was “the launch of additional missiles against additional targets”. An amendment from Leach, which his colleagues accepted, said

‘To cover the event of there being any surplus assets over and above those required to attack Moscow, additional strategic targets would be added to the list’²¹⁹

Miller advised Beetham that it was important to “preserve assets” which were able to meet the core criterion of an attack on Moscow. In the speaking notes for the Chief of Air Staff he wrote, “accept use of additional resources on alternative targets but must preserve weapons for delivery of ‘blow from the grave’”.²²⁰

This shows that the term “additional missiles” meant missiles deployed over and above the number necessary to attack Moscow. Miller refers to “the additional assets accruing from C4 and D5”. His speaking notes for Beetham mention “additional missiles available through Chevaline/Trident”.²²¹

It is likely that, in the case of Chevaline and both Trident systems, the additional missiles included those on the second submarine. For Trident D5, and possibly C4, a single boat was able to carry more missiles than were needed for the attack on the capital city itself.

Beetham argued that there should be a range of additional targeting options for the extra missiles. This was almost certainly also the approach taken in the initial DPS paper (DP11/81).

The division between Leach and his colleagues was over the nature of these additional options. The DPS report (DP11/81) probably argued that the UK should have Limited Nuclear Options in its strategic targeting plans. In discussions between the Chiefs of Staff, Bramall had asked his colleagues how they should respond if the Soviet Union mounted a nuclear strike on a military target.

Beetham’s response was that a “full riposte” would not be credible and that the UK “must have flexibility”.²²²

Beetham pointed out that, although the Soviet Union openly said that they would engage in an all-out nuclear conflict, in reality they might launch limited strikes. Interviews with former Soviet Rocket Force commanders, following the end of the Cold War, showed that this was correct. Just as Russia sought to conceal this approach, so the Chiefs of Staff argued that they should keep secret their

²¹⁹ AIR8-2846 British strategic nuclear targeting, Sec/CNS, 8/10/81

²²⁰ AIR 8-2846 e67ii Brief for Chief of Air Staff for presentation to SofS on strategic nuclear targeting, Group Captain Miller, 23 October 1981

²²¹ AIR 8-2846 e67ii Brief for Chief of Air Staff for presentation to SofS on strategic nuclear targeting, Group Captain Miller, 23 October 1981

²²² AIR 8-2846 e67ii Brief for Chief of Air Staff for presentation to SofS on strategic nuclear targeting, Group Captain Miller, 23 October 1981

plans for LNOs because, “it could degrade our deterrent posture if any lesser options were made public”.²²³

Miller’s briefing said,

“Additional assets should be targeted in accordance with an agreed priority list. Release of weapons to targets should not irrevocably be linked to a single push-of-a-button: options must be made available.”²²⁴

He described the approach taken by Leach (CNS), in his description of the disagreement between the Chiefs of Staff,

“In clearing the submission the main issue of contention was reference to ‘a single target list’. Implicit in the reference was CNS’s contention that the employment of a single list ie Moscow plus, involved a ‘one-button-push’, simultaneously to release all assets”.²²⁵

Leach had complained that his term “single target list” was missing from the first draft of the submission from the Chiefs of Staff Committee to Nott. He sought to amend this by adding the words, “There should be a single target list with Moscow at the top”.²²⁶ Beetham, Bramall and Lewin rejected this. Leach produced a revised submission. Lewin produced his own redraft to supersede this. Lewin initially included the phrase “single target list” but, after a request from Bramall, he removed the word “single”.²²⁷

Leach was probably reflecting the traditional view of the national targeting of nuclear submarines. In May 1979 Quinlan described Polaris as “essentially a last-resort force, and moreover (at least in its present configuration) a one-shot force”²²⁸ This last-resort/one-shot approach was probably the basis of the national targeting policy for Polaris prior to the 1981 review. Quinlan’s remark hints at the possibility that a differently configured submarine force, such as Trident, might not be subject to the same constraints.

He later wrote,

“It was recognised within Government defence circles that Polaris – with high-yield warheads, not independently targetable, and mediocre accuracy – was not well-suited to providing more discriminate options, but that more flexible options might become available with the advent of Trident.”²²⁹

This primarily refers to how the MOD moved away from targeting cities. However, it also hints at the potential to have a number of different targeting options for Trident, including LNOs. Miller, in his

²²³ AIR 8-2846 e67ii Brief for Chief of Air Staff for presentation to SofS on strategic nuclear targeting, Group Captain Miller, 23 October 1981

²²⁴ AIR 8-2846 e67ii Brief for Chief of Air Staff for presentation to SofS on strategic nuclear targeting, Group Captain Miller, 23 October 1981

²²⁵ AIR8-2846 e67ii

²²⁶ AIR 8-2846 e53

²²⁷ AIR 8-2846 e67ii Brief for Chief of Air Staff for presentation to SofS on strategic nuclear targeting, Group Captain Miller, 23 October 1981

²²⁸ DEFE 25-433 e64 p2, Long Range Theatre Nuclear Force, M Quinlan, 31 May 1979

²²⁹ The British Experience, Michael Quinlan, in Getting MAD, Nuclear Mutual Assured Destruction, its origin and practice. Henry D Sokolski (ED), Strategic Studies Institute, 2004

speaking notes for Beetham, described the new targeting policy a “more pragmatic flexible posture.”²³⁰

In summary, the core criterion was Moscow. For Trident, targeting would move away from cities, per se, to specific facilities. This implies that the central component of the new policy was to attack key sites within Moscow. The most likely targets for Trident D5 would have been the command centres in the city listed in Option 1 of the Duff-Mason report.

The submission to Nott appears to have highlighted the potential for Trident D5 to be used in an attack on “Moscow plus hardened bunkers”. This would have included the Option 1 command centres outside the city.

Beyond this, it is likely that DP11/81 and the DCDS(I) presentation raised the possibility of creating new options for UK strategic nuclear targeting. Despite opposition from Leach, the proposal for LNOs was probably agreed.

It is unlikely that the MOD would allocate LNOs to the first submarine on patrol, as this would compromise the “blow from the grave”. They could assign LNOs to the third submarine, as suggested in the Chiefs of Staff discussion in December 1978. Allocating LNOs to the second submarine would have been problematic. The most destructive way to use the submarine force was to assign targets from a single list, with all submarines launching their missiles simultaneously, if possible. If the second submarine launched one or two missiles at specific targets then the probability that it could later launch its remaining missiles would be reduced, because of the risk that the vessel might be destroyed.

Submarines armed with Polaris and Chevaline, operating in the Atlantic, were only able to attack targets West of the Urals. The Duff-Mason report had argued that the additional range of D5 was unnecessary for UK purposes. However, in 1981 the DPS said that Trident D5 “bestows some advantage in allowing targets within the whole of the USSR to be reached from the Clyde estuary and Norwegian Sea, and the Ural mountains from the US eastern seaboard.”²³¹ They said that a D5 missile with 8 warheads had a range of around 6,000 nautical miles.

The DCDS(I) presentation on 5 October ended with the following recommendation,

- “To proceed with Part II of the Study
- (a) East of Urals
 - (b) D5 for whole of USSR”²³²

This indicates that the initial review of potential targets was restricted to the Soviet Union West of the Urals. DCDS(I) was due to identify key facilities in the rest of the Soviet Union in Part II of their investigation. The result of this work is not known. It is likely that they will have identified key facilities East of the Urals, including underground command centres.

The DCDS(I) presentation indicated that one area where further work was required was the use of “RAF assets” in strategic nuclear targeting. The main airborne nuclear capability that will have been considered was Tornado.

²³⁰ AIR 8-2846 e67ii Brief for Chief of Air Staff for presentation to SofS on strategic nuclear targeting, Group Captain Miller, 23 October 1981

²³¹ AIR 8-2846 e47i US strategic nuclear force – Chiefs of Staff advice, Note by the Directors of Defence Policy, 2 October 1981

²³² AIR8-2846 e48 Outline of presentation on strategic nuclear targeting

National and NATO targeting of Polaris and Trident

The formal position, established in the Polaris Sales Agreement 1963, was that Polaris would be assigned to NATO except where the UK government might decide that its supreme national interests were at stake. In practice, the NATO targeting plans were a secondary consideration. Michael Quinlan described the NATO assignment of Polaris as “notional”,

“Both Polaris missiles and the remaining V-bombers were declared to NATO and notionally tasked by NATO military staffs in plans for General Nuclear Release, though amid the vast plethora of systems available there was a good deal of artificiality about finding targets to assign to them.”²³³

The Duff Mason report (1978) argued that, as a nationally-targeted force, Polaris provided important support to the alliance, but, in its NATO-targeted role, Polaris did not make a numerically significant contribution.

In its national role, Polaris was the “last resort” force. The circumstances in which in which the UK government might release Polaris to NATO were very limited. As the report explained,

“it is a clear, if necessarily implicit, assumption in our planning that the Polaris force would not be released for use in its NATO role short of a general war involving the United States strategic forces”.²³⁴

In 1979 Lord Carver, former Chief of Defence Staff, suggested that Polaris replacement and the modernisation of Theatre Nuclear Forces (TNF) should be considered together. Quinlan argued against this. With regard to Polaris, he said,

“I suspect moreover that it is not in our interest to do anything that would spotlight the long-standing ambiguities – whose quiet continuance is helpful, on the whole – that bear on the force. It is indeed declared and targeted by SACEUR on ‘sub-strategic’ military targets; but the fact is – as our allies must realise, if they think about the matter – that it is essentially a last-resort force, and moreover (at least in its present configuration) a one-shot force”²³⁵

In a second letter, Quinlan addressed the specific concerns of the West German government,

“Our SSBNs are a one-shot last-resort force, and any German who thinks seriously about them must in the end realise this, even though it doubtless suits them, as it does us, to stress the NATO declaration and targeting.”²³⁶

Neil Cameron, Chief of Defence Staff, adopted a similar line. In a personal letter to Carver, he said,

“those of them [NATO allies] who really think about these matters know perfectly well that whatever the theory may be, in practice Polaris is, and its successor will presumably be, a

²³³ The British Experience, Michael Quinlan, in Getting MAD, Nuclear Mutual Assured Destruction, its origin and practice. Henry D Sokolski (ED), Strategic Studies Institute, 2004

²³⁴ Duff-Mason Part I para 20

²³⁵ DEFE 25-433 e64 TNF Modernisation, Michael Quinlan to Patrick Moberly, 31 May 1979

²³⁶ DEFE 25-433 e64 TNF Modernisation, Michael Quinlan to PS/PUS, 31 May 1979

force of last resort, and not (as the TNF role requires) of ‘sub-strategic’ escalation capability”.²³⁷

Frank Cooper, the Permanent Under Secretary (PUS) at the MOD, felt that many of the allies had not really thought this through. Previous attempts to portray, inaccurately, the Polaris force as primarily assigned to NATO Long Range Theatre Nuclear Forces (LRTNF) may have been too successful.

Richard Mottram, his personal secretary, wrote,

“[PUS] remains concerned that virtually all other countries believe Polaris is a LRTNF – this goes right back to the Nassau Agreement and successive British Governments have stressed the international rather than the national. Perhaps the thrust of the Government’s public policy stance needs some change – or would this put at risk the US willingness to provide a Polaris replacement?”²³⁸

UK governments had stressed that they had assigned Polaris to NATO, not just to persuade their allies in Europe, but also to secure support from the US Congress.

A paper from February 1980 refined arguments that Mrs Thatcher’s government might use to justify the decision to acquire Trident C4. With regard to NATO, it said,

“The arguments about assignment to NATO are not particularly strong ones in our internal deliberations, although they may be useful in presentation of our decisions later on, eg to our Allies and to Congress.”²³⁹

²³⁷ DEFE 25-433 e60 p2

²³⁸ DEFE 25-433 e70 p1

²³⁹ DEFE 24-2112 e2 Attachment to Successor Options, Michael Quinlan, 4 February 1980.

Annex Estimate of casualties

A map attached to the Duff Report showed the area in Russia which was thought to be protected by the ABM system.²⁴⁰ On this map there are 31 numbered cities. Moscow is 1 and Leningrad is 2, but the numbering of the other cities does not match exactly their relative populations. In several cases cities which have particular military or economic significance are higher on the list than others with larger populations. This numbering may reflect the prioritisation given to cities in nuclear attack options.

Below are estimates of the casualties associated with several counter-city “unacceptable damage” criteria, based on this list of cities.

	Damage criteria	Fatalities @ 50% 1962-77	Fatalities @ 40% 1978
1962 JIC assessment	Moscow, Leningrad & 3 cities	8.4 million	
1962 JIC assessment	Moscow, Leningrad & 18 cities	16.3 million	
1969 Polaris one boat	Moscow, Leningrad & 5-8 cities	9.8-11.5 million	
1972 JIC assessment	Moscow	3.9 million	3.1 million
1976 Polaris one boat	10 cities, excluding Moscow	4.1 million	
1978 Duff Option 2	Moscow, Leningrad & 2 cities		6.2 million
1978 Duff Option 3a	10 cities, excluding Moscow		3.3 million

In criticising Owen’s one-million-dead criterion, Quinlan said the Duff-Mason options were an order of magnitude higher. The above figures suggest that the Duff-Mason options would result in less than 10 million fatalities. However there would have been around 10 million fatalities from the proposed attack by one Polaris submarine in 1969. So the 10 million figure may have been used within the MOD.

²⁴⁰ Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Part II Criteria for Deterrence, Annex A: Unacceptable Damage, 30 November 1978, DEFE 25-335.

City List

- | | | |
|-------------|-------------------|---------------|
| 1 Moscow | 11 Dnepropetrovsk | 21 Krasnodar |
| 2 Leningrad | 12 Kazan | 22 Krivoy Rog |
| 3 Kiyev | 13 Donetsk | 23 L'vov |
| 4 Kharkov | 14 Yerevan | 24 Yaroslavl |
| 5 Gor'kiy | 15 Volgograd | 25 Nikolayev |
| 6 Baku | 16 Rostov | 26 Tula |
| 7 Kuybyshev | 17 Saratov | 27 Izhevsk |
| 8 Minsk | 18 Voronezh | 28 Tolyatti |
| 9 Odessa | 19 Riga | 29 Kishinev |
| 10 Tbilisi | 20 Zaparozhye | 30 Ivanovo |
| | | 31 Penza |

