

## Unacceptable Damage

### Summary

Between 1960 and 1980 there were a number of studies into the extent of devastation that the United Kingdom should be able to inflict in a nuclear attack on the Soviet Union. In 1960 the JIGSAW group developed the concepts of breakdown of a nation and breakdown of a city. In 1962 the Joint Intelligence Committee said the destruction of Moscow and four other cities would constitute unacceptable damage to the Soviet Union. Ten years later the committee said that the destruction of Moscow alone would be sufficient. This was a key justification for the Chevaline programme.

In 1977 ministers called for a review of the Moscow criterion. The ensuing study had a different focus. It was a general investigation to establish the deterrence criteria for a successor to Polaris. The report by Sir Antony Duff identified a range of options, some of which excluded Moscow. Consideration of Duff's report was delayed, partly because of a fear that it might influence a decision on the funding of Chevaline.

When the report was presented to Labour ministers, in December 1978, there were calls, particularly from David Owen, for a lower level of damage. In contrast, after the Conservative government came to power in May 1979, the MOD successfully pushed for the most demanding of Duff's options – an attack on command bunkers in and around Moscow. Michael Quinlan later argued that the shift, away from attacking cities per se, was made for ethical reasons. However the visible archive evidence suggests other reasons for this change and it indicates that the new approach would not reduce civilian casualties.

This paper is based on a study of documents from the National Archives, most of which were released between 2005 and 2011.<sup>1</sup>

### Damage criteria studies 1960-1977

Michael Quinlan described how the MOD 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.”<sup>2</sup>

In 1960/61 the Joint Interservice Group for the Study of All-out War (JIGSAW) looked into the effect of a major nuclear attack on the Soviet Union.<sup>3</sup> The starting point for JIGSAW's work was –

“the realisation that various estimates that had been made of the size of the threat needed to deter attack were largely guesswork – subjective estimates of Soviet views on the definition of ‘unacceptable damage’”.<sup>4</sup>

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<sup>1</sup> Thanks are due to Brian Burnell for uncovering the documents and providing copies.

<sup>2</sup> 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.

<sup>3</sup> Initial studies were carried out by the Joint Global War Committee which was formed in 1956. This was renamed as JIGSAW towards the end of 1959. *A JIGSAW puzzle for operational researchers: British global war studies, 1954-1962*, Richard Moore, *Journal of Strategic Studies*, 1997.

JIGSAW decided to approach the problem by first establishing the maximum amount of damage that might be caused and then considering progressively lower levels. In this way they hoped to identify the minimum that would be unacceptable to Moscow.<sup>5</sup>

The group discovered a law of diminishing returns. Their first study was into an "annihilation" attack on the Soviet Union. 1000 warheads, each with a yield of one Megaton, would kill 55 % of the population of the Soviet Union, but it would require 4000 similar warheads to increase the proportion of fatalities to 90%.

JIGSAW developed the concept of "breakdown of a nation". This took account of the fact that the number of people affected by an attack was significantly larger than the number of casualties.<sup>6</sup> On this basis, 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.<sup>7</sup> 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.

The group then calculated the level of destruction needed to achieve breakdown in the Soviet Union. They concluded 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 could be reduced to 100-200.

The concept of breakdown was also applied to individual cities. JIGSAW's approach was that if 30% of the buildings in a city were destroyed then the whole population of that city would be affected, as would 20% of those living within 20 miles of the city (Later reports refer to 40% and 50% damage to a city for breakdown).

In a further study, JIGSAW calculated the level of destruction required for breakdown in Leningrad region. They estimated that this would require 8 one-Megaton warheads. Scaling this up across the Soviet Union, they made a crude estimate that UK forces would need to deliver 150-200 warheads to achieve breakdown of the nation.

The initial plan had been that JIGSAW would look at progressively lower levels of damage, but this part of their work was never completed. JIGSAW supported a wider study of nuclear requirements by the British Nuclear Deterrent Study Group (BNDSG). BNDSG reduced the figures of 100-200 warheads which had been proposed by JIGSAW -

"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".<sup>8</sup>

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

<sup>5</sup> A resume of JIGSAW studies on breakdown, IJ Shaw, 19 April 1966, DEFE 19-91

<sup>6</sup> For example JIGSAW calculated that the whole population of a city would be "affected" if 30 % were casualties. What is a deterrent ? paper by IJ Shaw D/D Sc 1/7 for CSA, 30 June 1971, DEFE 19-129 e2

<sup>7</sup> JIGSAW said that Japan had reached breakdown before the atom bombs were dropped on Hiroshima and Nagasaki. What is a deterrent ? paper by IJ Shaw D/D Sc 1/7 for CSA, 30 June 1971, DEFE 19-129 e2

<sup>8</sup> Damage Capability of the POLARIS Force, Report from IJ Shaw (DCSO(R)) to AUS, 26 October 1967, DEFE 24-189 e54

In December 1959 BND SG's assessment had been that the V-bomber force should be able to detonate 44 one-Megaton warheads.<sup>9</sup> In February 1962 Sir Robert Scott, the Chair of BND SG, proposed that the number of cities to be attacked could be reduced to 10, which would lower the cost of the proposed Skybolt system. In March 1962 Ministers agreed a reduction to 15 cities.<sup>10</sup>

In the same year, 1962, the Joint Intelligence Committee (JIC) made an assessment of what might constitute unacceptable damage to the Soviet Union. The committee ranked cities in the Soviet Union. Points were awarded for size of population, civil and administrative centres, economic importance, military command posts and telecommunications facilities. The five cities which scored highest were selected. Moscow was on top of the list. The 1962 JIC assessment became known as the "Moscow criterion".<sup>11</sup>

JIC concluded "the certain destruction of their five largest cities would put them at an unacceptable disadvantage in relation to the United States."<sup>12</sup> This damage threshold was in force until 1972.<sup>13</sup> In March 1972 the assessment was summarised as "the destruction of Moscow and the next four largest cities in the USSR".<sup>14</sup>

A second part of the 1962 JIC assessment said that the destruction of 20 cities would be an "unacceptable blow" to the Soviet Union.<sup>15</sup>

In 1964 the Chief of Naval Staff argued that Polaris would need to be able to destroy 20 cities. This would require five submarines, with two on patrol at all times.<sup>16</sup> A 1967 study considered the effect of an attack on 30 cities from two submarines. It concluded that there was a 96 % chance that 20 cities would be hit, if there were no effective ABM defences.<sup>17</sup> According to Kristan Stoddart, by the time Polaris was deployed, in 1968, the criterion was 7-10 cities, including Moscow and Leningrad.<sup>18</sup>

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<sup>9</sup> Four of these would be on Moscow, two on Leningrad, and one each on 38 other cities. This would result in at least 50% destruction in each city. British Nuclear Doctrine: The 'Moscow Criterion' and the Polaris Improvement Programme, John Baylis, Contemporary British History, Vol 19, No 1, Spring 2005.

<sup>10</sup> British Nuclear Doctrine: The 'Moscow Criterion' and the Polaris Improvement Programme, John Baylis, Contemporary British History, Vol 19, No 1, Spring 2005.

<sup>11</sup> 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

<sup>12</sup> 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; This phrase is also quoted, as part of the 1962 JIC assessment, in Evolution of British Strategic Nuclear Capability, 9 March 1978, DEFE 68-405 e6, para 6

<sup>13</sup> "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;

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

<sup>15</sup> Evolution of British Strategic Nuclear Capability, 9 March 1978, DEFE 68-405 e6, para 6

<sup>16</sup> Maintaining the Moscow Criterion: British Strategic Nuclear Targeting 1974-1979, Kristan Stoddart Journal of Strategic Studies, Vol 31, No 6, December 2008, page 900

<sup>17</sup> 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.

<sup>18</sup> Maintaining the Moscow Criterion: British Strategic Nuclear Targeting 1974-1979, Kristan Stoddart, Journal of Strategic Studies, Vol 31, No 6, December 2008, page 901

In 1971 Hermann Bondi, Chief Scientific Adviser at the MOD, wrote a paper with his personal views on the requirement for nuclear weapons. 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".<sup>19</sup>

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".<sup>20</sup>

Bondi's approach was criticised by two of the MOD officials who received his paper.<sup>21</sup> 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"<sup>22</sup>

Proposals to improve Polaris, so it could defeat Soviet ABM defences, were due to be discussed by Ministers in the autumn of 1972. Prior to this, the Chiefs of Staff committee reviewed the rationale for strategic nuclear forces. On 16 May 1972 the Defence Intelligence Staff (DIS) wrote to JIC asking for a new assessment. They 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.<sup>23</sup>

In their request to JIC, DIS pointed out that the Soviet Union's deployment of ABM was a sign of what they valued most highly.<sup>24</sup> In 1971 the CIA had a similar view, that the construction of ABM defences around Moscow was a sign that the Soviet leadership considered the capital city to be particularly important.<sup>25</sup>

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<sup>19</sup> 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

<sup>20</sup> 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".

<sup>21</sup> "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;

<sup>22</sup> The purpose of the UK's deterrent, CSA, 13 October 1971, DEFE 19-129 e6

<sup>23</sup> 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

<sup>24</sup> "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

<sup>25</sup> 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](http://www.foia.cia.gov/docs/DOC_0000278526/DOC_0000278526.pdf)

The main conclusion of JIC's 1972 assessment was that "provided we had the ability to destroy Moscow we would have the ability to inflict unacceptable damage on the Soviet Union."<sup>26</sup> However, JIC also raised the possibility of attacking 10 cities, excluding Moscow.<sup>27</sup>

In 1977 Michael 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.<sup>28</sup>

The emphasis on Moscow was described, in 1978, in the following terms –

"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".<sup>29</sup>

The Soviet Union was "a highly centralised state in which all important decision-making is centred on Moscow".<sup>30</sup>

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.<sup>31</sup> From 1975 they drew up a number of alternative targeting plans, excluding Moscow, to cover the years before Chevaline was deployed. One plan was based on the 1972 JIC option of 10 other cities.<sup>32</sup> In June 1976 it was suggested that 5 of these cities would be enough.<sup>33</sup> Aware of the contradiction between the importance placed on the Moscow criterion, especially for Chevaline, and the reality of nuclear targeting in the late 1970s, Quinlan argued that excluding Moscow was only acceptable as a temporary arrangement.<sup>34</sup>

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<sup>26</sup> 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;

<sup>27</sup> Maintaining the Moscow Criterion: British Strategic Nuclear Targeting 1974-1979, Kristan Stoddart *Journal of Strategic Studies*, Vol 31, No 6, December 2008, page 906

<sup>28</sup> "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

<sup>29</sup> 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.

<sup>30</sup> 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.

<sup>31</sup> "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.

<sup>32</sup> Maintaining the Moscow Criterion: British Strategic Nuclear Targeting 1974-1979, Kristan Stoddart *Journal of Strategic Studies*, Vol 31, No 6, December 2008, page 906;

<sup>33</sup> Maintaining the Moscow Criterion: British Strategic Nuclear Targeting 1974-1979, Kristan Stoddart, *Journal of Strategic Studies*, Vol 31, No 6, December 2008, page 909

<sup>34</sup> "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

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”.<sup>35</sup>

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*.”<sup>36</sup>

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%.<sup>37</sup> The new standard was adopted by 1978.<sup>38</sup> 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 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”.<sup>39</sup>

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.”<sup>40</sup>

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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

<sup>35</sup> 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.

<sup>36</sup> Long Term Strategic Nuclear Working Party Interim Report, 30 August 1971, AIR” 19184 a24

<sup>37</sup> Future Strategic Systems, report of a Navy Department working group, 1977, DEFE 19-271 e42

<sup>38</sup> 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.

<sup>39</sup> 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.

<sup>40</sup> 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 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.

### Criteria for Deterrence report 1978

During the early 1970s officials in the Navy began to consider a replacement for Polaris.<sup>41</sup> 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.<sup>42</sup>

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.<sup>43</sup>

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.<sup>44</sup>

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".<sup>45</sup>

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."<sup>46</sup>

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

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<sup>41</sup> 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

<sup>42</sup> "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

<sup>43</sup> Chevaline and Successor Systems, cover note for Defence Secretary's ministerial meeting, Michael Quinlan, 24 October 1977, DEFE 70-783 e59.

<sup>44</sup> "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.

<sup>45</sup> 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

<sup>46</sup> Conclusions of a ministerial meeting held at No 10 Downing Street on Friday 28 October 1977 at 0945, PREM 16-1564 e15

weaken the credibility of the deterrent as a whole.<sup>47</sup> Denis Healey argued that Chevaline should be cancelled if the Moscow criterion was not required.<sup>48</sup>

The meeting commissioned three studies. One study 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."<sup>49</sup>

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.<sup>50</sup>

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".<sup>51</sup>

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.<sup>52</sup>

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".<sup>53</sup> It was to "avoid any preconceptions of about the importance of Moscow as a target".<sup>54</sup> The task was assigned to a small "Criteria for Deterrence" group chaired by Sir Antony Duff.<sup>55</sup>

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

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<sup>47</sup> Conclusions of a ministerial meeting held at No 10 Downing Street on Friday 28 October 1977 at 0945, PREM 16-1564 e15

<sup>48</sup> "[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

<sup>49</sup> Nuclear Matters, Note of a meeting held in Sir John Hunt's Room, 2 November 1977, DEFE 68-405 e1

<sup>50</sup> "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

<sup>51</sup> 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

<sup>52</sup> Conclusions of a ministerial meeting held at No 10 Downing Street on Friday 28 October 1977 at 0945, PREM 16-1564 e15

<sup>53</sup> Nuclear Matters, Note of a meeting held in Sir John Hunt's Room, 2 November 1977, DEFE 68-405 e1

<sup>54</sup> Nuclear Matters, Note of a meeting held in Sir John Hunt's Room, 2 November 1977, DEFE 68-405 e1

<sup>55</sup> 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.



British deterrent.”<sup>56</sup> This was corrected and replaced with their original aim “to examine the continuing validity of the Moscow criterion”.<sup>57</sup> 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.<sup>58</sup>

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.<sup>59</sup> Owen amended this to “the conclusions which Ministers reach on this group’s report”.<sup>60</sup> 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.

The timescale which the Duff group would consider was amended. In November 1977 Sir Clive Rose, Cabinet Office, drafted an outline of the group’s possible work. This included one heading – “Forward look (to 2000)”. At their initial meeting, in January 1978, the group agreed that they would consider a timescale of up to 2010.<sup>61</sup> In July Quinlan said their report was focused on the period 1990-2015, when a successor system would be in service.<sup>62</sup> 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.<sup>63</sup>

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

- (1) Command centres inside and outwith Moscow.
- (2) Moscow, Leningrad and 2 other big cities.
- (3) Targets excluding Moscow – (3a) 10 cities and (3b) 30 single-warhead targets.<sup>64</sup>

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”.<sup>65</sup>

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<sup>56</sup> 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

<sup>57</sup> 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

<sup>58</sup> Criteria for Deterrence, Note of a meeting on 4 January 1978, DEFE 68-405 e2

<sup>59</sup> 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

<sup>60</sup> 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

<sup>61</sup> Criteria for Deterrence, Note of a meeting on 4 January 1978, DEFE 68-405 e2

<sup>62</sup> 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

<sup>63</sup> Framework for the study of the criteria for deterrence, Clive Rose, 7 November 1977 DEFE23-291 e05

<sup>64</sup> 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)

The most certain or "surest" deterrent (Option 1) might also, in Rose's earlier term, be described as the maximum criterion.<sup>65</sup> In the same way the minimum criterion would appear to be Option 3b, which was still considered to be "adequate".

The Duff group described, in an annex to their report, their basis for assessing "unacceptable damage".<sup>67</sup> 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. Option 2, breakdown-level damage to four cities including Moscow and Leningrad, was close to the five largest cities proposed by JIC in 1962. Option 3a, breakdown-level damage to 10 cities excluding Moscow, had been proposed by JIC in 1972 and seriously considered in 1975. 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.

In drafting these options, 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."<sup>68</sup>

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

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

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<sup>65</sup> Criteria for Deterrence draft report, 25 May 1978, DEFE 23-219 e50;

<sup>66</sup> 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.

<sup>67</sup> 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.

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

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.”<sup>69</sup>

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.”<sup>70</sup>

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.”<sup>71</sup>

Following Hunt’s advice, the Prime Minister postponed the ministerial review of Chevaline and authorised 12 months funding for the project.<sup>72</sup>

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 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.<sup>73</sup> 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.

### **Ministers’ consideration of the Criteria for Deterrence report**

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”.<sup>74</sup> Owen offered a different criterion. He proposed that one million deaths anywhere in the Soviet Union would be “more than adequate”.

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<sup>69</sup> Criteria for Deterrence, letter from Douglas Wass to Sir John Hunt, 27 June 1978, DEFE 23-219 e57.

<sup>70</sup> 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

<sup>71</sup> Criteria for Deterrence, Draft minute from Sir John Hunt to Prime Minister, 12 July 1978, DEFE 23-219 e71

<sup>72</sup> “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

<sup>73</sup> Studies on the Future of the British Deterrent, Draft minute from Sir John Hunt to Prime Minister, 27 October 1978, DEFE 23-291 e98

<sup>74</sup> Letter from David Owen to Jim Callaghan, 11 December 1978, PM/78/138, Nuclear Papers, David Owen, Liverpool University Press, 2009, p 149.

The MOD criticised Owen's approach. Quinlan described one million dead as "a strike of relatively modest proportions".<sup>75</sup> He pointed out that this would be an order of magnitude lower than the current threshold and he added,

"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".<sup>76</sup>

Quinlan argued that the scale of destruction should relate to the 20 million Soviet civilians who had died in the Second World War.<sup>77</sup>

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".<sup>78</sup> Destroying less than 10 cities, excluding Moscow, might be enough.

There was a second ministerial meeting on 2<sup>nd</sup> 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.

Margaret Thatcher was victorious in the election. The Defence Policy Staff produced a commentary on the Duff-Mason report for the new government. This questioned the conclusion of the Duff report than any one of the damage criteria options would be adequate. The commentary dismissed the least demanding option (Option 3b, 30 single-warhead attacks) as "insufficient" in the light of Soviet casualties in the Second World War – "this must give at least a measure of the threshold with which UK planning has to deal".<sup>79</sup>

In contrast with the meeting of Labour ministers in December 1978, which considered criteria below those in the Duff report, once the Conservative government was in place the MoD emphasised the importance of Option 1, the most demanding of the report's alternatives. The Duff report's recommendation that the minimum criteria could be met if Moscow was left off the target list was quickly ignored.

In November 1979 Francis Pym, the Defence Minister, wrote to Prime Minister Thatcher recommending a force of 5 submarines with Trident C4 missiles - "I believe that a force capable of

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<sup>75</sup> Nuclear Matters, letter from Michael Quinlan to PS to Secretary of State for Defence, 18 December 1978, DEFE 25-433 e21

<sup>76</sup> Nuclear Matters, letter from Michael Quinlan to PS to Secretary of State for Defence, 18 December 1978, DEFE 25-433 e21

<sup>77</sup> Quinlan did not take due account of the fact that the proposed system would enter service 45 years after the end of the Second World War.

<sup>78</sup> Cabinet Nuclear Defence Policy, Note of a meeting held at 10 Downing St on 21 December 1978, PREM 16-1978 e4

<sup>79</sup> 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.

threatening Soviet central government would have on any Soviet leadership a more certain effect than one that is limited to threatening centres of population".<sup>80</sup>

Under the Conservative government, a revised Part 3 of the Duff-Mason report, dealing with the alternative systems, was produced. In October 1979 a paper was written to accompany the report when it was presented to ministers at their MISC 7 committee meeting. A handwritten comment, probably by Richard Mottram, criticises the cover note:

"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."<sup>81</sup>

The draft was amended. There is a less critical comment on the second version. It indicates how the Duff-Mason options compared with the damage criteria which were in force in 1979 –

"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 flexibility.
- d. On this argument – and cost and risk – C4 MIRV is best".<sup>82</sup>

The debate had shifted since 12 months earlier, when Labour ministers had criticised all the Duff options for being too destructive. Now there was a clear push for the most demanding choice, Option 1, which required five submarines armed with Trident C4. Mottram's approach of "buying flexibility" presumably meant purchasing a system which would be capable of Option 1, in case they later decided to go down that road.

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<sup>80</sup> The Successor to Polaris, Letter from Francis Pym to Margaret Thatcher, 1 November 1979, DEFE 25-434 e80-1

<sup>81</sup> 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.

<sup>82</sup> 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.

## Attacking bunkers – an ethical option ?

The Conservative government's public statement on Trident in 1980 said that it would threaten "key aspects of Soviet power". The Duff report was the main guide to damage criteria at this time.<sup>83</sup> The Defence Staff Commentary on the Duff/Mason report says the UK could threaten "functions of key importance to the Soviet State" or cities or both.<sup>84</sup> It is clear that "key aspects of Soviet power" refers to Option 1 in the Duff report.

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".<sup>85</sup>

This is consistent with attacking command bunkers both inside the city and outside it. Quinlan went on to say -

"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."<sup>86</sup>

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 was meant to convey not counter population, not counter city and that it was in there for ethical reasons."<sup>87</sup>

There is no evidence, within the information visible in the National Archives, which indicates that the Duff group created Option 1 on the basis of ethics or a concern for sparing civilian populations.<sup>88</sup> In an early draft of Part 1 of the Duff-Mason report, Rose produced a series of arguments for and against Britain retaining nuclear weapons.<sup>89</sup> The moral dimension of the debate was noticeably absent.

The ethical argument may have been a later rationalisation of the shift towards targeting command bunkers. Much of the detailed consideration behind the Duff group's damage criteria remains classified. It is possible that some of the redacted sections in the 1978 documents might support

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<sup>83</sup> The Duff/Mason options continued to be influential beyond 1980. The outline of a presentation on Strategic Nuclear Matters for the Chiefs of Staff, dated 21 September 1981, has a heading "Deterrent criteria" with two subheadings: (i) Moscow and (ii) Duff/Mason options. DEFE 25-435 e54.

<sup>84</sup> 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.

<sup>85</sup> Quinlan in Getting MAD page 273.

<sup>86</sup> Quinlan in Getting MAD page 273.

<sup>87</sup> Renewing Britain's Independent Strategic Nuclear Deterrent: A debate, RUSI.

<http://www.rusi.org/analysis/commentary/ref:C45F69446BEF2F/>

<sup>88</sup> It is reasonable to assume that Quinlan's comments relate to Option 1 in the Duff report. Although drafted for the Labour government in 1978, it is clear from the archives that the Duff report remained the main guide to Damage Criteria for at least the first two years of the Conservative government.

<sup>89</sup> The Politico-Military requirement for a UK nuclear deterrent, 28 June 1978, DEFE 69-405 e23

Quinlan's thesis. What can be said, from the information released, is that there were other, non-ethical, reasons for introducing Option 1.

The Duff 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).<sup>90</sup>

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".<sup>91</sup> 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 –

"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."<sup>92</sup>

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".<sup>93</sup> The Duff report introduced a significant departure from this. Option 1 focused on the centres of the Government system rather than the city per se.

At an early meeting, on 23 February 1978, the Duff 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".<sup>94</sup>

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

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<sup>90</sup> 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.

<sup>91</sup> 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.

<sup>92</sup> 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.

<sup>93</sup> Draft Minute from PUS to Secretary of State, 22 June 1976, DEFE 19-274 e28a para 4

<sup>94</sup> Criteria for Deterrence, minute of meeting 23 February 1978, DEFE 68-405 e3

“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.”<sup>95</sup>

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.”<sup>96</sup> This proposal, Option 1, was also described as: “disruption of the main governmental organs of the Soviet state”<sup>97</sup>, “the loss of governmental control, with great collateral damage”<sup>98</sup> and “destruction of the Soviet governmental capability”.<sup>99</sup> A letter from the Chief Scientific Adviser in September 1979 confirms that the targets in Option 1 included hardened bunkers.<sup>100</sup>

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”.<sup>101</sup>

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

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<sup>95</sup> 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.

<sup>96</sup> 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.

<sup>97</sup> Defence Policy Staff Commentary, DEFE 25-335 e97(i), as quoted in Maintaining the Moscow Criterion: British Strategic Targeting 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.

<sup>98</sup> 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).

<sup>99</sup> 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.

<sup>99</sup> Factors Relating to Further Consideration of the Future of the United Kingdom Nuclear Deterrent, Summary of Part III, DEFE 25-434 e25b para 3

<sup>100</sup> “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

<sup>101</sup> 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.



"The demands made by Damage Criteria Option 1, in terms of ballistic warheads delivered, are about double those made by any other option."<sup>102</sup>

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.<sup>103</sup>

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.

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<sup>102</sup> 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.

<sup>103</sup> 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.