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TRIDENT BRITAIN'S WEAPON OF MASS DESTRUCTION

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Executive Summary

Nuclear weapons are not a myth or an abstraction. There are real warheads on a British Trident submarine on patrol and there are detailed plans specifying the latitude and longitude of points on the globe against which these weapons are ready to be used. The Navy keeps three Trident submarines armed, with 14 missiles and 48 nuclear warheads on each. There are 50 % more warheads deployed on British submarines today than there were in 1990.

The Labour Governments retention of Trident is inconsistent with the way in which thinking on nuclear weapons has moved - with many former advocates of the bomb arguing that there is an urgent need to abolish these weapons. Some observers say the risk of nuclear war is greater now than it was several years ago. Today more countries have the bomb. Russian nuclear forces are kept on a hair-trigger alert because they are vulnerable to an attack from US Trident missiles.

In the 1950s and 1960s Britain had plans to attack a large number of cities in the Soviet Union using V bombers or Polaris missiles. These plans were later adjusted so an attack would concentrate on targets around Moscow. Today the scale of Britains nuclear capability and the way it is deployed suggest that it remains oriented principally against Russia.

An attack using the warheads on one submarine against likely targets in the Moscow area would result in over 3 million deaths. This type of attack would involve some weapons detonating inside Moscow and others at command posts close to the city. The combined effects of blast, heat and radiation would mean that there would be very few survivors within 1.6 kms of each explosion and large numbers of fatalities 4 kms away. Because the warheads would be detonated close to the ground, there would also be massive nuclear fallout over urban areas. Thousands of people would die over a 4 to 12 week period from this fallout.

Other potential targets are Russian Northern Fleet submarine bases. In Britain there are towns and villages close to every key submarine facility. The same is true of the Russian bases near Murmansk. Trident warheads exploding above these bases would cause devastation over a wide area and in each case would result in thousands of civilian casualties in urban areas.

Trident has an additional "sub-strategic" role. For this a reserve submarine will have some missiles carrying one warhead each. Even if it had a reduced yield, a single one of these warheads would still cause devastation over an area of 30 square kilometres.

In addition to having independent target plans, British nuclear weapons are also incorporated into NATO nuclear planning, which is dependent on US targeting information. The use of all the

Trident warheads deployed on three British submarines either in a NATO or an independent attack could result in around 9 million deaths.

In 1996 the International Court of Justice made it clear that nuclear weapons are not exempt from the rules of war. The basis of humanitarian law is that parties to any conflict should seek to distinguish between civilians and the military. In each of the examples considered it is clear that the use of Trident would result in a massive number of casualties across a wide area. It would not be possible to accurately predict which places would be affected by fallout. The inherent inability to distinguish between civilian and military objects means that the threat or use of Trident would be illegal.

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1. Deterrence and the risk of nuclear war

1.1 Deterrence

[1.2 Risk of Nuclear War](#)

The theory of nuclear deterrence has been fatally undermined. At the same time there is a growing awareness of the real and substantial danger that nuclear weapons will be used.

1.1 Deterrence

Deterrence, which was responsible for the nuclear peril of the last 50 years, has been overtaken by the changed political landscape, with the collapse of the Soviet Union and the emergence of new nuclear weapon states. At the same time the theory has been ridiculed by many of its former advocates.

Today one of the most powerful critics is General Lee Butler. After a career in Strategic Air Command, Lee Butler was in operational command of all US nuclear weapons from 1992 to 1994. Since retiring he has argued very strongly for the abolition of the weapons he was once in charge of. He says that "(deterrence) was based on a litany of unwarranted assumptions, unprovable assertions and logical contradictions. It suspended rational thinking about the ultimate aim of national security to ensure the survival of the state".[1](#)

In a statement which could well be addressed to the Ministry of Defence. Lee Butler has said: "... the Cold War lives on in the minds of those who cannot let go the fears, the beliefs, and the enmities born of the nuclear age. They cling to deterrence, clutch its tattered promise to their breast, shake it wistfully at bygone adversaries and balefully at new or imagined ones. They are gripped still by its awful willingness not simply to tempt the apocalypse but to prepare its way."

[2](#)

The columnist Peregrine Worsthorne used to promote the bomb, but he now argues for disarmament and criticises his former stance - "That an individual could proudly say this -give me liberty or give me death - is more than understandable. But we armchair Cold War warriors in the West were saying more than this. We were saying that the whole human race, the greater part of which was neutral in the Cold War, should be put at risk to preserve Western liberty. How could we have believed anything so preposterous ?"[3](#)

We now know that the world came even closer to nuclear war in the 1960s than was realised at the time. The former US Defence Secretary, Robert McNamara, has held meetings with his Soviet counterparts. He discovered that the US had completely misjudged the situation on the

ground during the Cuban missile crisis. America had considered an all out attack on Cuba, not knowing that there were Soviet battlefield nuclear weapons on the island and that the Russian Generals had been given authority to use them.⁴

Those key players who have turned against deterrence are not only saying that it is now irrelevant. They are also saying that nuclear deterrence was wrong in the past, that it placed the world in great peril and it is only by luck that we came through the Cold War without a nuclear holocaust. Having survived so far by chance, they are determined that the dangers which persist are removed.

Today there are new dangers of nuclear war in South Asia following the nuclear tests conducted by India and Pakistan. At least one military analyst has said that now each side has a nuclear deterrent, the risk of war in the subcontinent has been reduced.⁵ This argument is consistent with the perverted logic of the Cold War, but totally divorced from reality. If we followed this "deterrence" model then, in every future international conflict, both sides should arm themselves with nuclear weapons.

1.2 Risk of nuclear war

The Bulletin of Atomic Scientists maintains a "Doomsday clock", which illustrates their assessment of how close we are to nuclear war. Having moved the hand further away from midnight at the end of the Cold War, they have moved it closer and closer in recent years. Initially in 1995 when it became clear that the nuclear weapons powers had not responded to the new climate and were holding on to their huge arsenals. Secondly in 1998 in response to the nuclear tests carried out by India and Pakistan

Throughout the Cold War, America and Russia kept huge arsenals of nuclear weapons poised to strike each other in a global suicide pact of mutual assured destruction. The end of the Cold War has resulted in some progress towards arms control. Today the US and Russian nuclear force commanders can visit each other's bunkers and missile silos.⁶ These exchanges are important. But they are also a symbol of the ridiculous situation we are now in. However much the political climate has changed, the nuclear stand-off has continued. The terrible truth is that both Generals still keep thousands of nuclear weapons ready to be launched at minutes notice at their old adversary.

While there are fewer weapons today, those that remain are more accurate and more effective. The number of US Trident submarines armed with D5 missiles is increasing and a new B61-11 earth penetrating bomb is being deployed.⁷ Each year the US conducts a major exercise which rehearses global nuclear war. These Global Guardian exercises include the actual deployment of Trident submarines.

Bruce Blair, a former US missile officer, urges that nuclear forces must be taken off alert. He has warned the US Congress about the current plight of Russia's nuclear forces: "Growing reliance on intentional quick use (of nuclear weapons) in a crisis and growing susceptibility to unintentional use means that the nuclear situation is more unstable and perilous today than it was during the Cold War." ⁸

The decline in Russian conventional forces has meant that their Defence policy places greater emphasis on nuclear arms. They have also adopted a "launch on warning" posture, partly because of the accuracy and short flight times of US Trident missiles. The Russian military feel that their missiles are vulnerable to being destroyed by a US first strike and so their own nuclear response system is kept on a hair trigger alert. [9](#)

Two specific cases show how dangerous this is. The first was during the political crisis in Russia in 1991 when Russian intelligence in Cuba wrongly reported that US nuclear forces had increased their state of alert. [10](#) This message could easily have resulted in rocket forces being put on the brink of an attack. Fortunately it was ignored.

The second scare was when the Norwegians fired a scientific rocket in 1995. The letter notifying the Russians had been ignored. When a radar operator detected the launch he thought the missile could reach Moscow. The black box which follows Yeltsin everywhere was activated. A message was sent to the nuclear forces to increase their state of readiness. Only then was it realised that the rocket was harmless. [11](#)

It would be wrong to conclude from these examples that there is a Russian threat and that we must have the bomb to keep it at bay. The danger which exists arises from the weapons themselves and from the failure, so far, to use the political window of opportunity for disarmament. The current situation highlights what was always the case - that nuclear weapons are the problem, not the solution.

Notes

1. The risks of nuclear deterrence, General Lee Butler, National Press Club, 2 Feb 1998
2. *ibid*
3. The Old Bombers who are now for Banning the Bomb, Peregrine Worsthorne, Spectator, 7 Mar 1998
4. The US knew about the medium range missiles on Cuba but not the battlefield nuclear weapons which could have been used in response to an invasion. Reflections on War in the 21st century, Robert McNamara, speech in Edinburgh, 8 Apr 1998.
5. Colonel Michael Dewar of the International Institute for Strategic Studies.
6. Visit of General Habiger, Commander of US Strategic Command to Russian nuclear facilities, US DoD News Briefing, 4 Nov 1997
7. Overkill is Not Ddead, Brian Hall, New York Times, 14 Mar 1998
8. Statement to US Congress by Bruce Blair, 13 Mar 1997. Russia declared in 1982 that they would not be the first to use nuclear weapons, but this was repudiated in 1993
9. *ibid*
10. Prospects for the unsanctioned use of Russian Nuclear Weapons, CIA, Sep 1996
11. Washington Post, 15 Mar 1998

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2. Status of Trident

2.1 - Trident submarines, missiles and warheads

[2.2](#) - Comparison with nuclear submarine force levels during the Cold War

2.1 Trident submarines, missiles and warheads

Since April 1998 all British nuclear weapons have been based in Scotland. Trident submarines operate from Faslane and the adjacent Coulport nuclear depot. The submarines are:

HMS Vanguard

armed with 48 warheads, carried out its first patrol in December 1994, due to go into Devonport Dockyard for a refit in 2002

HMS Victorious

armed with 48 warheads, carried out its first patrol in January 1996

HMS Vigilant

armed with 48 warheads, carried out its first patrol in June 1998

HMS Vengeance

launched in September 1998, due to be operational in 2001.

There are 42 missiles deployed on submarines.[12](#) There are probably 14 missiles on each of the 3 submarines in service. The total number of missiles is not expected to increase when HMS Vengeance becomes operational.

Each missile can carry several warheads. George Robertson has said that "All three Trident submarines normally in the operational cycle will have 48 warheads loaded".[13](#) This means that there are a total of 144 nuclear warheads deployed.

The total number of warheads deployed at sea can be increased at any time from 144 to at least 180. The Defence Secretary has said that spare warheads are kept to "provide potential to deploy additional weapons should that ever become necessary." [14](#)

Mr Robertson has made it clear that no Trident warheads would be decommissioned as a result of the Defence Review.[15](#) He has also said that new warheads will be built in future to replace some of those currently in service.

Each warhead has a yield of around 100 kilotons, which is around 8 times the power of the bomb which destroyed the city of Hiroshima. The total yield of all the warheads deployed on submarines based in Scotland is around 14.4 megatons, which is equivalent to over 1000 Hiroshima bombs.

Most missiles probably carry 4 warheads. A small number of missiles are assigned to a "sub-strategic" role and each carry one warhead. It is not clear whether these warheads have the same yield as the others.

2.2 Comparison with nuclear submarine force levels during the Cold War

Since 1968 Britain has had one nuclear armed submarine on patrol at all times. The Defence Review makes it clear that this will continue. With Polaris there was always one fully armed submarine in reserve and sometimes two in reserve. This will also continue with Trident.

There are substantially more nuclear warheads deployed on submarines today than there were in the early 1990s:

In 1992 there were only 64 Polaris warheads deployed. [16](#) In January 1997 there were 120 Trident warheads deployed. This rose to 180 later in 1997 and declined to 144 following the Defence Review in July 1998. This is illustrated in [Chart 1](#).

The number of warheads on each submarine since Polaris entered service is indicated below:

1968 - 1982

Polaris submarines with 48 Polaris warheads per submarine

1982 - 1996

Polaris submarines with 32 Chevaline warheads per submarine [17](#)

1998 onwards

Trident submarines with 48 Trident warheads per submarine

The Defence Review states that the total yield of all warheads on one Trident submarine today will be one third less than the total yield of all warheads carried on a Polaris submarine. However the Trident warheads are far more accurate and can be targeted independently. The House of Commons Defence Committee described the move from Polaris to Trident as "a significant enhancement of the UK's nuclear capability", in the light of the increased accuracy of the missiles, their longer range and greater sophistication. [18](#)

Until April 1998 Britain also had a number of nuclear bombs which could be dropped from aircraft based in England and Germany. These have now all been withdrawn from service. While this has resulted in a reduction in the total numbers of nuclear weapons, it has also meant that all British nuclear weapons are now based on the Clyde.

notes

12. Vanguard collected 16 missiles, Victorious 12 and Vigilant 14. Hansard 27 Nov 1997

13. Hansard 28 Jul 1998

14. Hansard 9 Nov 1998. There were 60 warheads deployed on each submarine until Jul 1998, with a total of 180 deployed from when Vigilant became operational in Nov 1997. Following the Defence Review 12 warheads were removed from each submarine. Hansard 16 Jul 1998. The Defence Review said that the total number of operationally available warheads would be less

than 200, giving a maximum of 56 in storage. The primary reason these warheads are kept is probably in anticipation of an increase in the effectiveness of Russian ABM defences. The current state of the Russian economy indicates that a steady decline in ABM capability is more likely. In addition to these operational warheads there are more which are kept as a processing margin and others which are undergoing surveillance. Including these, the total stockpile may be slightly higher than 200.

15. "we do not need to decommission any warheads to implement the Strategic Defence Review changes. Adjustments are being made to future warhead production ... " George Robertson, Hansard 16 Jul 1998.

16. From April 1992 to June 1993 and again from October to December 1994 there were only two Polaris submarines armed. HMS Revenge was decommissioned before HMS Renown was operational in 1992/3 and HMS Resolution was decommissioned before HMS Vanguard was operational in 1994.

17. Strategic Defence Review (SDR), MoD, Jul 1998, Supporting Essay 5, para 10.

18. Progress of the Trident Programme, Defence Committee 2nd Report, May 1994, p xiv

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3. Targeting of British nuclear weapons

[3.1](#) - Targeting a large number of cities

[3.2](#) - Moscow Criterion

[3.3](#) - Strategic Targeting of Trident today

[3.4](#) - Alert status

3.1 Targeting a large number of cities

From 1956 to 1969 British strategic nuclear weapons were carried by V-bombers. Initially these carried atom bombs and later hydrogen bombs. There were two ways in which the bombers might have been given tasks. One was as part of a joint US and British nuclear force in a NATO attack. The second was as an independent British force, for which a British target plan was drawn up. According to a memorandum written by the Chief of Defence Staff, in 1959 a list was made of all Soviet cities with a population of over 100,000. From this list 98 cities were selected as targets on the basis of their administrative importance and population - the largest being chosen.

In 1968 the V-bombers were replaced by Polaris submarines. There were three armed submarines, with a fourth in refit. Each of the three armed submarines carried 16 missiles. Documents released in 1998 reveal that the initial British target plan for Polaris was aimed at 48 cities in the Soviet Union.

3.2 Moscow criterion

The former Permanent Secretary at the Ministry of Defence, Michael Quinlan, has indicated that British targeting has moved away from the plans described above. In discussing the ethics of nuclear weapons he talks about "final-sanction nuclear- strike" plans and says -

"The central idea in such plans would be to inflict disabling damage upon the aggressor state as a state, so as to remove or emasculate its ability and disposition to persist as an evil force against others, while keeping as low as possible (appallingly grave though that would probably still be) the harm done to innocent citizens. There is little doubt that in the earlier days of the nuclear age strategic targeting was not generally shaped in this way; but as time went on both US and UK planning options - French, Soviet, and now Russian ones may be a different matter - moved significantly in this direction " [19](#)

What appears to have happened is that the focus of British targeting shifted from choosing a large number of cities on the basis of their population, to focusing on the Soviet and Russian

command and control structure. [20](#) The centralisation of the old Soviet regime was such that this command and control system was and is heavily concentrated around Moscow. Field Marshall Nigel Bagnall, Chief of General Staff 1985-88, has said of the targeting of Trident "It is more than just the destruction of Moscow, it is the destruction of their command and control system". [21](#)

If we look at past US nuclear planning, Soviet "leadership" targets were a special category. The ability to launch an attack on this command structure was regarded as crucial and as the last option in a nuclear exchange. [22](#) In its independent plans Britain probably has this command structure as the main focus for its targeting. Quinlan would no doubt argue that launching a nuclear attack on this command structure is not the same as aiming to destroy Moscow, but it would, nonetheless, turn the city into a radioactive desert.

It is clear that the ability to launch an attack on the Moscow area has been the key factor determining the nature of British strategic nuclear forces since the mid 1970s. At this time the Anti-Ballistic Missile (ABM) system around the city was enhanced. Military planners in Britain calculated that this ABM system would prevent Britain from launching a nuclear attack. So a new British system, Chevaline, was designed specifically to overcome these ABMs. Chevaline was in service from 1982 to 1996. The missiles were armed with decoys as well as warheads. The plan was to launch all 16 missiles from the submarine on patrol at Moscow as quickly as possible. The missile trajectories were adjusted so that all the warheads and decoys would land at around the same time and swamp the ABM defences.

Admiral Lord Lewin played a key role in the decision to build Trident. He has stressed the importance of the Moscow Criterion. He said: "Moscow was at the core of the Russian psyche, if you wiped out Moscow you destroyed the Soviet Unions will to succeed." [23](#)

3.3 Strategic targeting of Trident today

While the Strategic Defence Review appears to suggest that there is no threat to British security and specifically no nuclear threat, the actual deployment of Trident described in the Review is not consistent with this. [24](#) The Review indicates that it is the Government's intention to retain Trident on patrol for at least 20 years. With regard to responding to a strategic attack on NATO the Review says: "This Mission therefore provides for longer term insurance through a credible nuclear deterrent and the retention of essential military capabilities on which we could rebuild larger forces over a long period, if circumstances were radically to worsen." [25](#) The Review does not assign particular conventional forces to meeting a strategic attack on NATO as this is regarded as a remote possibility and only a potential threat in the long term. Yet this approach is not sustained in the nuclear area. The nuclear plans are not for a force which could be reconstituted with months or years of notice should the situation change, but to have one submarine at sea at all times.

In seeking to justify Trident, the Strategic Defence Review says that "very large numbers of strategic and shorter range nuclear weapons .. remain as a potent potential threat to the security of Britain and our Allies should current circumstances change for the worse." [26](#) This is alluding primarily to Russia's nuclear arsenal.

Michael Clark, who has close contacts with the MoD, indicates that the Moscow criterion is still the key factor which determines how many Trident warheads are deployed. With regard to the Defence Review he said: "The ABM defences around Moscow remain the logical yardstick against which British strategic nuclear weapons are judged, since this represents the only defensive screen they might be required to penetrate in the foreseeable future."[27](#)

The idea of deploying nuclear missiles on submarines emerged during the Cold War as a way of concealing the location of the missiles from the Soviet Union. Keeping one submarine on patrol was designed to ensure that the submarine could not be destroyed either by Soviet missiles, or by Soviet submarines. The government has decided to continue having one submarine on patrol at all times. This is a clear indication that Trident is still regarded as primarily for use against Russia.

The Government have said that normally three Trident submarines will be fully armed at all times.[28](#) The day to day operations of the nuclear fleet confirm that this is the case. This constant armed status is a further indication that the Trident force is still geared up to a strategic nuclear exchange with Russia. In the Cold War stand-off no time was allowed for loading missiles or warheads onto the submarines, they were kept armed at all times. Several submissions were made to the Strategic Defence Review advocating that warheads and missiles should be removed from the submarines and stored on land. However the Ministry of Defence has rejected these proposals. Their policy is still to have nuclear weapons ready for use at short notice.

Further indication of the ongoing tension is the deployment of submarines to intercept missile submarines. It was reported that Russian submarines were sent to try to detect HMS Vanguard while it was carrying out trials. On the other hand it would appear that US hunter-killer submarines are still routinely stationed close to the Russian submarine bases. The Commander of the Russian Northern Fleet has objected to their presence. British hunter-killer submarines may also take part in these missions.

In the case of US nuclear forces, while the planning process now incorporates potential threats from anywhere, concern about Russia remains central - "Russia remains the focus of the Posture review not because its intentions are hostile, but because it currently controls the only nuclear arsenal that can physically threaten the survivability of US nuclear forces."[29](#)

3.4 Alert status

In the days of the V-bombers there were always several aircraft on Quick Reaction Alert, armed and ready for take off. Air Vice Marshall Bobby Robson said of the V- bombers "no-one could deny you were on a war footing".[30](#) With Polaris, the submarine on patrol was at 15 minutes notice to fire its missiles. Commander Jeffrey Tall, Captain of HMS Repulse from 1989 to 1991, said "There was no doubt that when we went to sea we went to war".[31](#)

The Strategic Defence Review says that the Trident submarines "are routinely at a notice to fire measured in days".[32](#) The submarine on patrol can be involved in hydrographic surveys, equipment trials and exercises with other vessels, so long as these tasks do not compromise its security. But the hair-trigger posture could be reintroduced at short notice - "Its readiness state could, however, be quickly increased if required".[33](#)

The Review failed to take the submarines off continuous patrol which would be the clearest indication of a lower state of readiness. With regard to the recent measures which have been taken, the Defence Secretary has said that "No physical changes to the missiles or guidance systems are involved" and that the submarine will remain "invisible and undetectable".³⁴ Michael Clark says that it is "a procedural, rather than technical, change and is not capable of international verification".³⁵ He also argues that de-alerting measures may be applied to parts of the large US and Russian arsenals, but not to the British nuclear force which he and the MoD regard as a minimum force. He says "the UK is not particularly sympathetic to the concept of de-alerting".³⁶

In 1994 an agreement was reached that the UK and Russia would no longer target each other. Under this agreement the computer inside the missile will be set at co-ordinates in the South Atlantic. But, the co-ordinates of real targets are still held elsewhere on the submarine, in a disk drive in a computer connected to the missiles.³⁷

Military planners will assume that, in a time of crisis, radio communications with submarines could be disrupted.³⁸ So, although a Trident submarine is capable of receiving targeting information by radio, lists of target data will be stored on board, in the Fire Control computers.³⁹ According to a former US Trident missile technician, it takes only 3 minutes to transfer the data from these computers into the missiles. Bruce Blair says that it takes 10 minutes to insert the target data and to accelerate the gyroscopes in the guidance system on the missile.⁴⁰

Notes

19. He also said that he would consider planning for "city bashing" to be immoral, Thinking about Nuclear Weapons, Michael Quinlan, RUSI Journal, Dec 1997
20. British Nuclear Targeting, Lawrence Freedman, in D Ball and J Richardson eds, Strategic Nuclear Targeting, 1986.
21. Moscow Criterion, BBC, Broadcast Jul 1995.
22. The Logic of Accidental Nuclear War, Bruce Blair, 1993, p122f
23. Moscow Criterion, BBC
24. The SDR said that "... there is today no direct military threat to the United Kingdom or Western Europe. Nor do we foresee the re-emergence of such a threat". SDR Jul 1998, p5. With specific regard to the threat from a nuclear armed enemy the Defence Secretary has also said that "We do not see any immediate nuclear threats to the United Kingdom". Hansard 10 Jun 1998. With no enemies in sight George Robertson has identified a more abstract opposition: "The world is now a much more complex and confusing place. However, some people continue to say, *who is the enemy now that the Warsaw pact has gone* ? I have a clear answer for them - the enemy is the instability that can threaten the peace and prosperity that we now enjoy." Hansard 27 Oct 1997. The Defence Review identifies new risks - "drugs and organised crime", "new and horrifying forms of terrorism", "serious environmental degradation" and the vulnerabilities of information technology. It says "we must make sure that the Armed Forces can play as full and effective a part in dealing with these new risks as the old". The idea that we need Trident to respond to these new dangers is absurd - but that does not mean that it is beyond the reasoning of the nuclear lobby. The Commander of the US Atlantic submarine fleet, Rear Admiral Roger Bacon, is on record as saying that Trident submarines and missiles were needed to act "as a defence against terrorism, drug trading and other global conflicts."

25. SDR p 16
26. SDR Essay 5, para 4
27. De-alerting and the UK Nuclear Deterrent, Michael Clarke, Centre for Defence Studies Bulletin, Oct 1998, p8. The former Defence Minister said "decisions about our force structures and postures should take into account what has proved hitherto to be successful in maintaining stability in the presence of Russia's military strength." UK Defence Strategy, A Continuing Role for Nuclear Weapons, Malcolm Rifkind, speech at Centre for Defence Studies, 16 Nov 1993, para 13
28. Hansard 28 Jul 1998
29. Nuclear Policy Review, 1995 Annual Defence Report, US DoD. This review also said that the US would have adequate weapons to "deter a hostile Russian government by holding at risk a range of assets valued by its political and military leaders."
30. Moscow Criterion, BBC
31. ibid
32. SDR Essay 5, para 12
33. Hansard Lords, 28 Jul 1998
34. Hansard 2 Nov 1998; Nuclear Disarmament in the Modern World, George Roberston, speech at Aberdeen University, 1 Mar 1999
35. Michael Clarke, op cit, p 8
36. ibid
37. Zero Alert for Global Nuclear Forces, Bruce Blair, Brookings, 1995, p87. This refers to the Fire Control system on US Trident submarines (MK98 Mod 4). The one on British submarines (Mk98 Mod 5) is almost identical
38. The film Crimson Tide gave a dramatic illustration of the implications of a failure in submarine communications.
39. In June 1997 the US Navy tendered for contracts for Power PCs and software for "evolving mission critical functions in support of Strategic Targeting System" for both US and UK Trident fire control systems. This provides a facility for rapid retargeting in addition to the main target sets. US Naval Surface Warfare Centre solicitation N00178-97-Q-0013
40. Zero Alert for Global Nuclear Forces, Bruce Blair, p87

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4. Effect of the use of Trident against the Moscow area

4.1 - Effect of an attack on 16 command bunkers using 48 Trident warheads

[4.2](#) - Effect of one of these warheads

4.1 Effect of an attack on 16 command bunkers in and around Moscow using the 48 Trident warheads from one submarine

The submarine on patrol will be prepared to launch an attack with all its 14 missiles and 48 nuclear warheads. This example assumes that all of these would be targeted at command centres in and around Moscow. It is likely that at least 2 warheads would be detonated at each command post. The target plan will take into account the fact that some incoming warheads could be destroyed by Russian ABM defences. For this reason it is assumed that 3 warheads are aimed at each bunker.[41](#) It should be noted that while this may be the most likely way that Trident would be used, it is not the most destructive. If the 48 warheads were aimed at 48 separate targets there would be substantially more casualties.

The following is a list of 16 command posts against which Trident might be targeted.[42](#) The table also shows how far each bunker is from the city centre of Moscow and in which direction it lies from the city centre.

Potential Targets for Trident

Location	Use of bunker	Direction	Distance
1. Defence Ministry	command	city centre	0 km
2. Lubyanka	command	city centre	0 km
3. Parliament	large bunker	city centre	0 km
4. Khodinka airfield	military intelligence	N of centre	6 km
5. Raminiki	large bunker	S of centre	6 km
6. E of Klimovsk	military	South	48 km
7. E of Chekhov	general staff	South	65 km
8. N of Chekhov	general staff	South	65 km
9. Sarapovo	defence council	South	68 km
10. Voronovo	government	South	56 km
11. Balabanovo	rocket forces HQ	South West	90 km
12. Vnukovo airfield	government	South West	25 km
13. Golicyno	satellite control	West	27 km

14. Perkhushkovo	rocket forces HQ	West	42 km
15. Balashikha	air defence HQ	East	25 km
16. Monino airfield	military airbase	East	38 km

These command centres are buried underground. [43](#) Nuclear weapons used against them would be detonated near the surface in a "groundburst" explosion. If a weapon is detonated in this way the immediate effects are less than in an "airburst" when the bomb explodes hundreds of metres above the surface. However, in a "groundburst" the fireball touches the ground which produces a crater. The debris in the crater is radioactive. It is thrown into the air and dispersed downwind - as nuclear fallout. This fallout results in massive radioactive contamination over a huge area. It is worth noting that the Hiroshima and Nagasaki bombs were both airburst. They did not produce the massive fallout which would result from the use of Trident against command bunkers.

The effect of this attack is shown in [Map 1](#) which shows the effect of an attack on 16 command bunkers in and around Moscow using 48 Trident warheads - 3 groundburst against each bunker (colour GIF 68 kb)

The map assumes the wind is from the South West. The combined effects of the explosions and fallout would be completely overwhelming in the central and northern parts of Moscow and in many of the towns and villages in the surrounding area. In the south of the city there would be some casualties from the effects of detonations 5 -10 kms away, this would be followed by fallout from attacks on the bunkers outside the city.

The effect of the fallout from attacks on the rural bunkers is illustrated by a statement made by General Butler, with regard to the US SIOP: "One of the exercises I asked my staff to go through was to remove all the weapons directly targeted on Moscow and just calculate radiation levels in the city by looking at the strikes upwind of the city in various climatological scenarios. The result was exactly as I would have predicted: the city was rendered uninhabitable for generations."[44](#)

The following is an estimate of the number of direct deaths from an attack on the Moscow area with 48 Trident warheads. [45](#) This includes fatalities from blast, heat, immediate radiation and deaths from fallout within 12 weeks.

Deaths within Moscow city

City Area	Population	Deaths
Central	668,733	564,744
North	969,148	303,404
Northwest	607,489	100,054
Northeast	1,115,145	780,602
South	1,350,341	21,336
Southwest	955,232	143,191
Southeast	846,374	2,708
West	972,938	454,946

East	1,208,175	166,003
Zelenograd	170,949	-
Total in city	8,864,524	2,536,988

Deaths outside Moscow city

Direction	Deaths
Northeast	214,328
East	109,595
Southeast	5,479
South	101,151
Southwest	34,568
West	22,619
Northwest	1,694
Total outside city	489,434

The total number of people who would die within 12 weeks in Moscow and the surrounding areas would be around 3 million, including around 750,000 children. Several million people would be injured.

The overall effect of an attack on this scale is particularly numbing. Anyone trying to flee would be likely to find themselves travelling through contaminated areas. The pollution of water supplies, destruction of homes and general devastation would result in secondary problems with disease. Radiation reduces the bodys ability to fight off illness. There would also be both short term and long term problems with food supplies, because of the contamination of agricultural land and disruption of transport. The figures above do not include those deaths which would arise indirectly from disease or other longer term fatalities

It is possible that the actual target plan would result in more casualties than illustrated. British Trident warheads would be most effective against shallow command posts and least effective against the deepest bunkers. There are many shallow bunkers inside the city. The British attack plan may also include airburst attacks on some facilities such as communications sites and airfields.[46](#)

The total effect of a massive nuclear attack on targets around an urban centre was illustrated in a 1981 study of the effects of a nuclear attack on the British capital, called "London after the bomb". This calculated the effect of an attack with 11 bombs, with a total of 6 Megaton groundburst and 7 Megaton airburst on targets around the city. This study concluded that the proportion of the citys population who would be killed within 8 weeks would be between 65% and 76 % . [47](#) Although the total yield of explosives in a British attack on Moscow would be less, the effect could be on the same scale.[48](#)

4.2 Effect of one of these warheads

This example shows the effect of just one of the 48 warheads which would be used in this attack - detonating at the Defence Ministry in central Moscow. Each warhead probably has a yield of around 100 kilotons.[49](#)

This is illustrated in three charts which show the effects of one 100 kilton warhead (groundburst detonation)

[Chart 2](#) drawing showing immediate effects and fallout

[Chart 3](#) graph showing immediate effects

[Chart 4](#) graph showing nuclear fallout

The effect of both immediate effects and fallout are also illustrated in [Map 2](#). (colour GIF 75 kb)

The calculations were been carried out using the Weapons Effect computer program produced for the US Defence Nuclear Agency in 1984. [50](#)

Within 1.35 km of the explosion the blast overpressure would be greater than 12 psi and the extent of damage by blast alone would be such that almost everyone would be killed.[51](#) In addition neutron and gamma radiation would be fatal to all who were exposed over a wider distance, 1.6 km.[52](#) So it is likely that 98% of those within 1.6 kms of the explosion would be killed.

Most buildings would be destroyed within 2.2 kms, with blast overpressure greater than 5 psi. Blast alone would result in 50 % fatalities. All those exposed to direct heat from detonation would be killed, within this distance. So total casualties within 2.2 kms could be 55% killed and 40% injured. [53](#)

There would be extensive damage to buildings within 4 kms, with blast overpressure greater than 2 psi. Blast alone would result in 5 % fatalities and 45 % injuries. Direct heat from the explosion would be at the lethal level of 6.7 cal/cm² as far as 4.5 kms from the centre.[54](#) This could raise the death rate within 4 kms to 8 %. If a high proportion of the population were in the open at the time of detonation this figure would be much greater.

Blast overpressure would be 1 psi at 6.6 kms away. Blast casualties would be 25 % injured. Those directly in line of sight of the explosion would suffer from serious burns, which would be complicated by the lack of medical treatment. This is assumed to result in 1 % fatalities within this area. The death rate could be substantially higher if many of the population were in the open, or if there were extensive fires. In the Hiroshima and Nagasaki explosions fires caused by the bombs were responsible for a high proportion of the deaths and injuries. Destruction caused by blast would be the major factor leading to fires.

The casualty rates mentioned so far have only taken account of the effects of blast, heat and direct radiation from the explosion. The other major factor is the nuclear fallout. The following calculations assume a windspeed of 10 knots and even population density within the city. Estimating immediate casualties from fall out depends on the degree of shelter which the population have. An average Protection Factor (PF) of 5 is assumed in this case. [55](#)

Within 5 kms downwind fallout would result in a Maximum Biological Dose of 2000 rads in the open. Taking account of the Protection Factor (PF5) this results in an average dose of 400 rads. These exposures would be accumulated within 72 hours of the explosion. 400 rads would result in 50 % fatalities.⁵⁶ Initial symptoms including vomiting would occur within < hour to 2 hours and last for 2 days. There would then be a latent period of 1 - 14 days when symptoms would be less obvious. After 2 weeks the victims would suffer from hair loss, diarrhoea, fatigue and uncontrolled bleeding from the mouth.⁵⁷ Around 50 % of healthy adults would die within 2 - 12 weeks from infection and internal bleeding.

Within 11 kms downwind fallout would result in a dose of 1500 rads in the open, or an average dose of 300 rads, for PF5. 300 rads would result in 50 % fatalities among adults who were already injured and 25 % fatalities among healthy adults. Death rates for children would be significantly higher. ⁵⁸

The immediate effects of fallout would extend over a far wider area. Those in the open, 83 kms downwind, could receive a dose of 300 rads, fatal in 25 % of cases. These calculations only show the fatalities within the initial 12 week period. There would be many more long term fatalities from cancers resulting from exposure to radiation.

The following is an estimate of the total casualties within 12 weeks resulting from the detonation of one Trident warhead, groundburst, at the Defence Ministry in Moscow:

Deaths from blast, heat and direct radiation:

125,000 ⁵⁹

Additional deaths from fall out (PF5):

28,000

Total number of deaths

153,000

18 % of the population of Moscow are under the age of 15. Children are particularly vulnerable to the effects of radiation, especially infants. The death toll within 12 weeks would include around 30,000 children. Sakue Shimohira was close to the epicentre of the Nagasaki bomb when she was a schoolgirl. She described the scene: "there were mothers crying for their children and children crying for their mothers and no matter how far they stretched their arms they could not be comforted."

The effects of the explosion would go beyond the immediate human casualties. The experience of Hiroshima and Nagasaki shows that schools, hospitals and churches would all be destroyed. The overall effect of the total destruction of property, physical injuries, radiation exposure and psychological damage are beyond comprehension.

Notes

41. US plans involve large number of warheads being used against some key targets. General Butler has said in the US nuclear plan (SIOP) there were 69 warheads targeted on one installation. Bruce Blair suggest that this was probably the Chekhov Command Bunker. Brian Hall op cit.

42. Based on information from the Federation of American Scientists (www.fas.org), Zero Alert

for Global Nuclear Forces, Bruce Blair, and the Logic of Accidental Nuclear War, Bruce Blair.

43. Robert Aldridge was a senior engineer in Lockheed working on the Trident Reentry Body. With regard to a Trident C4 missiles with Mk4 / W76 warhead using NAVSTAR for guidance he says "by sending two warheads from different missiles to the same target, known as 2-on-1 targeting, the probability of destroying a hardened missile silo would be 94%" Trident Resisters Handbook, Robert Aldridge, p 2.2-2. The warheads on UK Trident D5 missiles, without NAVSTAR but with improved stellar navigation, will have a similar capability. Bruce Blair says the US Trident force can destroy the Russian primary command bunkers, but not some of the deepest alternate command bunkers. Zero Alert for Nuclear Forces, Bruce Blair, p61. He has also given a formula for the effectiveness of nuclear weapons against bunkers. The Logic of Accidental Nuclear War, Bruce Blair, p 324. Calculations using this and the crater width from the Weapons Effect computer program suggests that UK Trident warheads might not destroy very deep bunkers. The US Nuclear Policy Review said of the US Trident force with W76 and W88 - "the Trident II (D5) missile - with its improved accuracy, range and payload relative to previous SLBMs - allows the SLBM force to hold at risk almost the entire range of strategic targets". 1995 Annual US Defence Report.

44. Brain Hall, op cit. 45. Casualty estimates for outside the city were based on population figures from the 1989 census for areas outside the city. The breakdown of population within Moscow is from Russia and the Post Soviet Scene, a Geographical Perspective, James H Baker, Arnold, 1996. Estimates of casualties were made using detailed maps of effects.

46 With regard to attacks on radio masts, General Lee Butler has said: "Take communications sites, for example. The most likely way to cripple a communications site is to strike an antenna. Now what is an antenna ? It's an ungainly spire of structural steel. If this wasn't a nuclear war, you would send an airplane with a couple of 500-pound bombs, or even send in a Special Forces team to topple the thing with dynamite. What do you do when you're a nuclear war planner ? You target a nuclear weapon against it. A nuclear weapon measured in the, what, half-megaton range ? Whatever it takes !" quoted in Brian Hall, op cit.

47. Medical Effect of Nuclear Weapons, British Medical Association (BMA), 1983.

48. Several smaller bombs will cause more damage than one large bomb of equivalent yield. The US Navy first deployed Polaris with a single one megaton warhead on each missile. This was later replaced with three warheads, each of 200 kilotons, which were expected to do as much, or more damage. The effect of fallout from ten 100 kiloton warheads would be significantly greater than that of a single 1 megaton warhead because it would fall to the ground more quickly.

49. This is the estimated yield of the W76 warhead which is used by the US Navy. According to the former Director of the Los Alamos nuclear weapons laboratory in the US, the British Trident warhead is a "Dutch copy" of the US W76. The British government has acknowledged that the warheads are contained in the Mk4 Reentry vehicle, which is used in the US for the W76 warhead. The yield of the W76 is given as 100 kt in Nuclear Weapons Databook, Thomas Cochrane et al, Natural Resources Defence Council, 1984, p74 and as 90-100 kt in US Nuclear Weapons, Chuck Hansen, Aerofax, 1988, p206.

50. Calculations carried out using Weapons Effects version 2.1 produced by Horizon Technologies for the US Defence Nuclear Agency, 21 December 1984 (WE), from [High Energy Weapons Archive](http://www.fas.org/nuke/hew) (www.fas.org/nuke/hew)

51. Office of Technology Assessment (OTA) guidelines, quoted in BMA op cit, p62

52. Combined gamma and neutron dose of 600 rads at 1.6 km. The particularly damaging neutron dose would be 140 rads at 1.6 km and 74 rads at 1.7 km

53. OTA guidelines are for 50% killed and 40% injured within this area. BMA op cit. Heat levels could be more than five times the lethal limit.

54. The OTA guidelines are that 6.7 cal/cm² produces eventual death and exposure to 3.4 cal/cm² produces significant injury, requiring specialist medical treatment, BMA, op cit, p69

55. The WE program calculates the Maximum Biological Dose that would be accumulated by someone in the open for 72 hours, taking no account of shelter provided by buildings. To translate this into the likely dose, a protection factor (PF) is applied. If people go about their normal day the average PF would be around 3. Joseph Rotblatt has suggested a PF of 5 for acute effects and 3 for long term effects. Old civil defence manuals suggested that if people made improvised shelters in the centre of their houses the PF would be higher than 10. BMA op cit p74f. The actual dose which would be acquired after a nuclear explosion would depend on how people responded, particularly in the first 24 hours. Other inputs in these calculations are windspeed 10 knots, crosswind 0, fission fraction 0.5, yield 100 kt. The WE program assumes that the dose is directly proportional to the yield, and in doing so probably underestimates the dose from warheads with yields of less than 500 kt, see note 48 above

56. BMA op cit p 84. Effects of Nuclear Weapons, High Energy Weapons Archive, Carey Sublette, para 5.6.3.4.1 (www.fas.org/nuke/hew)

57. Carey Sublette op cit

58. BMA op cit p 83f

59. This figure of 125,000 is based on the effect within the various areas described, assuming the population of Moscow is evenly distributed across the city. A rougher way of calculating casualties is to assume that everyone within the 5 psi contour would be killed but none outside it - assuming even population density. On this basis there would be 132,000 fatalities.

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5 Other examples of the use of Trident

[5.1](#) Effect of an attack on Russian Northern Fleet bases with one Trident missile and four nuclear warheads

[5.2](#) Trident in the sub-strategic role

[5.3](#) British nuclear weapons and NATO

[5.4](#) Effect of an attack using 3 submarines and 144 Trident warheads

5.1 Effect of an attack on Russian Northern Fleet bases with one Trident missile and four nuclear warheads

The lists of targets maintained by British and NATO nuclear planners are certain to include the submarine bases of the Russian Northern Fleet, near Murmansk. The map shows the effect of one missile being used against four submarine installations.

If one missile was fired it would leave the atmosphere and then release four nuclear armed Re-entry Vehicles (RVs). Each RV comes down through the atmosphere on a separate trajectory and lands on a separate target. Each of these RVs contain a 100 kiloton nuclear warhead. So one missile would cause 4 nuclear explosions. [Map 3](#) (GIF 44 kb) illustrates the effect of these warheads detonated as "airburst", ie several hundred metres above the ground.

One of these warheads would land on the town of Polyarny. This has a population of over 28,000 and it is close to several Russian Navy shipyards which are used to repair nuclear powered submarines. If a Trident warhead exploded in the air above the shipyard the town would be effectively destroyed. Around 90 % of the population would probably be killed by a combination of radiation, extreme heat and collapsing buildings. The few survivors would all be seriously injured. Even 5 kms from the explosion, anyone in the open would suffer from 3rd degree burns. There would be extensive casualties from blast damage 10 km away.

Each of the four warheads would result in substantial civilian casualties. The total number of civilian deaths which would result within 12 weeks would be around 90,000. Although each target area would be seen by the planners as a military area, in each case there is also a substantial urban settlement populated by families of sailors and of shipyard workers. There are obvious parallels with submarine establishments in Britain. The town of Helensburgh is close to Faslane and the village of Garelochhead is even nearer.

None of the targets in this example are inside a city. There are two other Northern Fleet facilities which are in cities - the submarine construction yard at Severodvinsk and the naval shipyard in Murmansk. The casualty list would be significantly higher if either of these two facilities were

added to the attack described. The proximity of these Russian facilities to urban areas reflects the situation in Britain - the submarine construction yard at Barrow in Furness is in the centre of a town and Devonport submarine base is in a city.

The illustration does not show the effects of dispersing nuclear waste which is stored at these Russian submarine bases. The amount of radioactive material which would be scattered down wind would be many times greater than released from the accident at Chernobyl. An attack like this would result in radioactive contamination on a massive scale within the Arctic circle and beyond.

Effect of 100 kt warhead (airburst)

distance	killed	injured
0 - 1.6 km	98 per cent	2 per cent
1.6 - 2.9 km	55 per cent	40 per cent
2.9 - 5.2 km	8 per cent	45 per cent

5.2 Trident in the sub-strategic role

Since 1996 Trident has also had a "sub-strategic" role. However there have been no obvious changes in deployment.[60](#) It is clear that the "sub-strategic" role is additional to, and not a replacement for the strategic role.

The Commander of 1 Submarine Squadron at Faslane has said that the sub-strategic role could be allocated to one of the submarines not on patrol.[61](#) If the submarine on patrol fires one missile its position is compromised and in the event of a strategic nuclear exchange it becomes vulnerable to attack. For this reason one of the two submarines which are not on patrol will be allocated a "sub-strategic" role, as well as its strategic role.

In November 1993 the Defence Minister Malcolm Rifkind said "It is .. important for the credibility of our deterrent that the United Kingdom also possesses the capability to undertake a more limited nuclear strike in order to induce a political decision to halt aggression by delivering an unmistakable message of our willingness to defend our interest to the utmost".[62](#) After the change of Government the Labour Party Minister John Reid made a similar statement - "The Government fully support NATO policy on the continuing requirement for a sub-strategic capability as a crucial element of credible deterrence. In extreme circumstances of self-defence such a capability would allow the limited use of nuclear weapons to send an aggressor a political message of the Alliances resolve to defend itself" [63](#)

A report produced within the Ministry of Defence advocates that British nuclear policy be revised to make it clear that sub-strategic Trident could be used in response to an attack with chemical or biological weapons. The Sunday Times quoted a source at the Ministry of Defence as saying "If we are attacked with biological or chemical weapons, we must be able to make a proportionate response. Other states need to be aware that we have nuclear weapons and would consider using them".[64](#)

The current official position is that Britain would not use nuclear weapons against a country if it was a signatory of the Non Proliferation Treaty (NPT) unless it was either a nuclear weapon state or allied to a nuclear weapon state.⁶⁵ The Government argue that this restriction does not apply to Iraq as it is in breach of the NPT.⁶⁶ Some people within the MoD are arguing that Britain should seek to revise the NPT so that nuclear weapons could be used against any country with chemical or biological weapons.

The submarine assigned to the sub-strategic role will have 3 or 4 missiles which have been prepared for this. Each of these missiles will have a single warhead. It is not clear whether these are identical to the normal Trident warheads, with a 100 kiloton yield, or have been modified to reduce their yield. MoD statements on this issue are deliberately misleading.⁶⁷ The following table indicates the effect of a 5 kiloton warhead detonated at 400 m airburst.⁶⁸ This is at the lowest end of what the sub- strategic yield might be.

Effect of 5 kt warhead (airburst)

Blast (psi)	Radius (km)	Area (sq km)	Killed	Injured
12	0.59	1.1	98 per cent	2 per cent
5	0.59 - 1.1	2.7	50 per cent	40 per cent
2	1.1 - 1.9	7.5	5 per cent	45 per cent
1	1.9 - 3.1	18.9	-	25 per cent

The thermal effect would be at a lethal level (6.7 cal/cm²) at a distance of 1.3 km from the explosion and there would be significant injuries from heat (3.4 cal/cm²) 1.8 km away. Immediate radiation would be at a level to be lethal to 90 % of those exposed at 1.2 km.

In presentations to the International Court of Justice Britain and other nuclear weapons powers tried to argue that there were possible situations in which a nuclear weapon could be used against a remote area as a demonstration. It is interesting that, within the context of the NATO Nuclear Planning Group, Michael Quinlan says that a similar "no-target" plan was dismissed - "It was judged, surely rightly, that this might well suggest precisely a lack of the tough resolve that it would be the whole aim of the action to demonstrate."⁶⁹

5.3 British nuclear weapons and NATO

There are two ways in which British nuclear weapons are targeted. Firstly, Britain maintains independent targets. As indicated above this primarily still relates to Russia and particularly the Moscow area. The second aspect of targeting is that Trident could be fired at targets determined within NATO. The Strategic Defence Review says that "the United Kingdom has committed all its nuclear forces, both strategic and sub-strategic to NATO".⁷⁰ During the Cold War the assignment of British nuclear forces to the NATO commander in Europe, SACEUR, meant that plans were prepared which envisaged their use against targets such as airfields, bridges and military facilities in Eastern Europe.

NATO continues to hold exercises which rehearse nuclear war. Exercise Able Ally 98 was probably primarily a command post exercise and probably did not involve the real deployment of

nuclear forces. However in these exercises NATO commanders will be practising on paper how they would use nuclear forces, including British Trident submarines.

NATO also still prepares nuclear war plans. In 1997 the US Defence Special Weapons Agency offered a contract for work for the NATO Nuclear Planning Systems Target Data Feed (NPTDF).⁷¹ This contract was for software to integrate the Nuclear Planning System within NATO with the revised target database system which is now used by the US.

The new interface has two functions. The first is to enable NATO to draw up nuclear attack plans. Secondly, NPTDF has a "crisis planning" mode where it can track fleeting targets. This reflects US nuclear planning today which incorporates not only a complex full scale Single Integrated Operations Plan (SIOP) but also the ability to generate options in less than 24 hours to attack targets anywhere in the world.⁷²

The NPTDF specifications show that the NATO system is dependent on US databases for target information. One of the sources of data is US Strategic Command (USSTRATCOM), who are responsible for US nuclear war plans.⁷³ There are probably also direct links between USSTRATCOM and the MoD with regard to the targeting of British Trident submarines.

The US currently maintains an operational nuclear arsenal, which is ready for immediate use, of 2,500 nuclear warheads. Recent military adventures have shown that the UK often joins in with US bombing campaigns. One way in which British nuclear weapons could be used, would be as part of US nuclear attack, the consequences of which would be unthinkable. There are still enough nuclear weapons around today to destroy the world several times over.

5.4 Effect of an attack using 3 submarines and 144 Trident warheads

In the case of the Polaris force deployed in 1968 it is clear that targets were allocated to all 3 of the armed submarines. The current British nuclear plan will include not only targets for the submarine on patrol, but additional targets for the other two armed submarines. The second submarine is probably on a few days notice to sail and the third on several weeks notice. In the case of Polaris, plans were drawn up for launching the missiles when a submarine was berthed at Faslane. Similar arrangements may be in place for Trident.

If the 144 warheads on 3 Trident submarines were all used against a range of targets, a proportion of which were in urban areas and others near urban areas then, on the basis of the figures for an attack on Moscow, there could be around 9 million deaths, including over 2 million children.

Even this does not illustrate the maximum potential damage. The legal adviser to US nuclear war planners has said that the US retains the right to deliberately attack cities as an act of reprisal.⁷⁴ It is possible that Britain also still has the option of deliberately attacking as many cities as possible, in a similar target plan to that adopted in the 1960s. If one Trident warhead was detonated in an airburst over an urban centre of a similar population density to Moscow this would result in around 200,000 fatalities.⁷⁵ If all 144 warheads were used in this way against separate centres of population the total death toll would be in the region of 30 million, including around 8 million children.

Notes

60. The only new development was the deployment of HMS Vanguard for a port visit to Gibraltar in November 1998. There were contradictory signals as to whether or not this visit was related to the crisis with Iraq at the time. It has been suggested that the submarine was not armed. HMS Vanguard would not need to redeploy to have the range to reach Iraq, but the visit may have been intended to send a message that this role was being considered. A missile launch from the Mediterranean might be slightly less likely to be misinterpreted by Russia.
61. "We wouldn't necessarily use the deployed submarine as the sub-strategic boat. We may sail another specifically in that role, so we have the flexibility of doing either or both." Commander Tom Herman, 1 Submarine Squadron, Navy News Clyde Supplement, May 1996
62. UK Defence Strategy: A Continuing Role for Nuclear Weapons, Malcolm Rifkind, speech at the Centre for Defence Studies, London, 17 Nov 1993
63. Hansard 26 Jan 1998
64. Sunday Times 8 Nov 1998
65. Foreign Minister Tony Lloyd at the Defence Committee hearing on the SDR, 23 Jul 1998
66. ibid
67. "The existing warhead can fulfil a sub-strategic mission" said MoD official Mr Beaver speaking at the Defence Committee meeting on the Progress of the Trident Programme, 16 Mar 1994. Rear Admiral Irwin at the same meeting said: "It is a fixed yield determined on manufacture." Whereas George Robertson said "The UK has some flexibility in the choice of yield for the warheads on its Trident missiles", Hansard 19 Mar 1998.
68. WE program
69. Michael Quinlan, op cit, p23f
70. SDR para 55
71. Modification one to Statement of Work for Nuclear Planning System Target Data Feed, US Defence Special Weapons Agency, 1997
72. Amending the SIOP is such a complex process that it takes around 12 months. The plan is revised annually, SIOP 99 is in effect until October 1999 when it is replaced by SIOP 00. Taking the Pulse, Nuclear War Planning, BASIC (www.basicint.org/planning.htm)
73. Information from installation, facility and equipment databases from USSTRATCOM is fed into the NATO nuclear planning system. Also the "(NSPTDF) interface will combine targeting data from USSTRATCOM with the appropriate records received from intelligence systems". NPSTDF SOW Mod 1, DSWA, 1997
74. Taming Shiva, Applying International Law to Nuclear Operations, Col C Dunlap, US Air Force Law Review, 1997, p 163
75. Based on areas of damage indicated in section 5.1 and Moscow average population density.

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6. Legal implications

On 8th July 1996 the International Court of Justice gave its advisory opinion on the legality of the threat or use of nuclear weapons. The Court said that "the threat or use of nuclear weapons would generally be contrary to the rules of international law applicable in armed conflict and in particular the principles and rules of humanitarian law".⁷⁶

This was followed by a phrase which has been picked up by the British government. The ICJ said: "the Court cannot conclude definitively whether the threat or use of nuclear weapons would be lawful or unlawful in an extreme circumstance of self- defence, in which the very survival of the State would be at stake."⁷⁷ While this leaves a theoretical potential loophole, it is important to note that the Court did not say that in these extreme circumstances the use of nuclear weapons would be legal. They failed to make any conclusion. This was a very contentious clause with strong opposition from several judges, for different reasons. It was only adopted following the casting vote of the chair, President Benaoui, who later commented: "I cannot overemphasise that the inability of the court to go further than the formal pronouncement at which it has arrived cannot in any way be interpreted as a half- open door to recognition of the legality of the threat or use of nuclear armaments."⁷⁸

The Court did decide unanimously that "a threat or use of nuclear weapons should .. be compatible with the requirements of the international law applicable in armed conflict, particularly those of the principles and rules of international humanitarian law ..." ⁷⁹. As Judge Weeramantry said: "The principles of humanitarian law apply to the conduct of self-defence, just as they apply to the conduct of any other aspect of military operations."⁸⁰ In the extreme circumstances when the survival of the state was at stake, any threat or use of nuclear weapons would still have to comply with humanitarian law.

The basic principle of humanitarian law is that of discrimination between civilian and military objects. This is repeated as the Basic Rule in the 1949 Geneva Convention: "In order to ensure respect for and protection of the civilian population and civilian objects, the Parties to the conflict shall at all times distinguish between the civilian population and the combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives."⁸¹ The current state of customary international law on this point is clarified in the ICJ opinion which says: "States must never make civilians the object of attack and must consequently never use weapons that are incapable of distinguishing between civilian and military targets". ⁸²

The likely British plans for the use of Trident as detailed in the examples earlier do not comply with this Basic Rule. In the case of the groundburst explosion of one Trident warhead, fallout is

dispersed over a huge area resulting in thousands of civilian fatalities. The maps show very crude projections of where the fallout would lie. The real fallout pattern would depend on the weather conditions. Even if these were known the mechanisms of dispersal are too complex to be accurately predicted. Those who plan a nuclear attack can predict that a groundburst explosion would contaminate a vast area with lethal levels of radiation, but could not anticipate the boundaries of that area. This must be one of the clearest possible examples of the indiscriminate use of a military weapon.

If we look at the specific example of the bunkers outside Moscow it is clear that the numbers of civilians at risk is very high. In setting a criteria of being able to attack facilities defended by the ABM system, the MoD has indicated that they are prepared to attack sites close to the city of Moscow. There are large towns throughout this whole area. In the case of each bunker, and whatever the wind direction, the fallout from an attack would reach urban areas. In most cases fallout from attacking a bunker would reach a town with a population of over 50,000 and in some cases fallout would affect hundreds of thousands.

It can be argued that as the primary plan will be to launch all the missiles on the submarine at once, we should look at the total effect of all 48 warheads. The map showed the effect with a South Westerly wind. If this were adjusted for all possible wind conditions, in every case there would be massive casualties both in the city of Moscow and in the surrounding towns and villages.

If we look at the example of an attack with one missile on Russian Northern Fleet bases, again there would be huge problems of radioactive contamination, this time from explosions near nuclear waste stores. Again the pattern of dispersal would be unpredictable.

Even if we put aside the issue of this nuclear waste, the case of the submarine bases shows how the destructive effect of a Trident warhead is so great that discrimination between military and civilian objects is impossible. Each "airburst" warhead would totally destroy an area 6 kms across and cause widespread damage over an area 14 kms across. When we look at real examples of the actual co-ordinates that are probably held in the computers of a Trident submarine it is clear that at these locations there are not only military facilities, but whole towns and villages which would be destroyed.

The actual configuration of most of the missiles, with around 4 warheads on each, indicates that again it is not sufficient to consider solely the effect of one warhead. The actual plans which are prepared would result in 4 warheads all landing at once. The illustration for the Murmansk area shows how some towns would be affected by the blast and heat from several explosions.

In the case of sub-strategic Trident, if the warhead has a yield in the region of 5 kiloton then this would result in significant numbers of casualties over an area of 30 square kilometres and total devastation of an area of 2.7 square kilometres. The area affected is so large that this weapon is not capable of distinguishing between civilian and military targets, as specified in the ICJ opinion.[83](#)

At the ICJ hearing the nuclear weapons states made submissions about the potential to build very low yield nuclear weapons which, while technically nuclear arms, produced effects which were

not totally beyond the scale of conventional explosives.⁸⁴ It is interesting to note that Malcolm Rifkind argued against very low yield nuclear weapons.⁸⁵ It is reasonable to conclude that the yield of sub-strategic Trident is not so low as to fall into this category.

In addition the justification which Rifkind used for sub-strategic Trident, "to send a message" and "in defence of Britains vital interests" would be unacceptable. Even with regard to weapons of a smaller yield than sub-strategic Trident, the Court said that the nuclear weapons states had not presented any satisfactory case of when these could legally be used. ⁸⁶

The legality of Trident has been questioned by Lord Murray, a retired Scottish High Court Judge and former Lord Advocate. He has considered the effects of using a sub-strategic Trident warhead against a military facility in or near a town and concludes that "such a weapon, so used, may well be considered to be inherently indiscriminate and so illegal to use." He added "the case for a lawful use of strategic Trident would be even more difficult to make. Its area of destruction would be city- sized .."⁸⁷

Additional Protocol I (1977) of the Geneva Convention is the most detailed law on this issue.⁸⁸ Under its provisions the threat or use of Trident would be clearly illegal. Any use of Trident would cause massive damage to the environment which would affect human health. This is explicitly outlawed in Article 55. Trident is also clearly an indiscriminate weapon as defined and prohibited by Article 51. Also Article 57 requires that - "In the conduct of military operations, constant care shall be taken to spare the civilian population, civilians and civilian objects".⁸⁹ This is regarded as an expression of customary law. Article 57 further requires that those who plan any attack must ensure that the objective is not a civilian object and that this plan would not result in excessive civilian casualties.

The Protocols also make references to civilian losses not being "excessive in relation to the concrete and direct military advantage anticipated". ⁹⁰ The International Committee of the Red Cross (ICRC) produced the initial draft of the Protocols and has published a detailed commentary on them. This notes that "proportionality is not quite at the same level as the fundamental principles governing the matter. It appears in a secondary and subsidiary role in Article 51 ... and in Article 57 It cannot therefore destroy the structure of the system, nor cast doubt upon the fundamental principles of humanitarian law. The principle of proportionality merely contributes to the clarification of matters, though it is true that this is important. Thus an attack cannot be justified only on grounds of proportionality if it contravenes the above-mentioned principles." ⁹¹

The ICRC commentary rules out any attack which causes massive civilian casualties. It says: "The idea has also been put forward that even if they are very high, civilian losses and damages may be justified if the military advantage at stake is of great importance. This idea is contrary to the fundamental rules of the Protocol ... The Protocol does not provide any justification for attacks which cause extensive civilian losses and damages. Incidental losses and damages should never be extensive." ⁹²

Successive British governments have played fast and loose with international law when it comes to nuclear issues. For 20 years British ratification of the Additional Protocols was delayed, because of concern about nuclear weapons. When they finally were ratified in January 1998, the

government added a statement to say that the new rules introduced by the Protocols did not apply to nuclear weapons. The governments approach is disreputable, but it is also largely futile. The threat or use of Trident is illegal, not only under the specific new rules introduced by the 1977 Geneva Convention Protocols, but also under the principles of customary international law, which are binding on all states.

The ICJ made it clear that if the use of a weapon was illegal, then the threat to use it was also illegal.⁹³ The current deployment of Trident comes close to being a threat.⁹⁴ There is always one submarine on patrol. That patrol is not an exercise or a trial but is a fully armed operational deployment. It is very likely that the fire control system computers on that submarine hold details of specific targets against which the missiles could be used in a relatively short period of time.

These questions about the legality of Trident are not obscure, they are fundamental. The President of the International Court of Justice described the atom bomb as a "blind weapon" and "the ultimate evil". President Bedjaoui also said "The existence of nuclear weapons is therefore a challenge to the very existence of humanitarian law."⁹⁵ To justify Trident is to assert the right to attack civilians in battle and to defend nuclear weapons is to undermine the place of international law in modern society.

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Notes

76. Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons, International Court of Justice (ICJ), 8 Jul 1996, para 105 (2)

77. *ibid*

78. President Bedaoui, ICJ, 8 Jul 1996

79. ICJ Opinion, 8 Jul 1996, para 105 (2) D

80. Judge Weeremantry, ICJ Opinion, 8 Jul 1996

81. Geneva Convention 1949 Article 48

82. ICJ Opinion, 8 Jul 1996, para 78

83. *ibid*

84. ICJ Opinion, 8 Jul 1996, para 94

85. "there is sometimes speculation that more so-called useable nuclear weapons - very low-yield devices which could be used to carry out what are euphemistically called surgical strikes - would allow nuclear deterrence to be effective in circumstances where existing weapons would be self-detering. I am thoroughly opposed to this view. The implications of such a development of a new war-fighting role for nuclear weapons would be seriously damaging to our approach to maintaining stability in the European context, quite apart from the impact it would have on our efforts to encourage non-proliferation and greater confidence outside Europe." UK Defence Strategy: A Continuing Role for Nuclear Weapons, Malcolm Rifkind, para 25.

86. ICJ Opinion, 8 Jul 1996, para 94

87. Lord Murray, speaking at Scottish Churches House, May 1998

88. "Additional Protocol I in no way replaced the general customary rules applicable to all means and methods of combat including nuclear weapons. In particular the Court recalls that all States are bound by those rules in Additional Protocol I which, when adopted, were merely the

expression of the pre-existing customary law, such as the Martens Clause, reaffirmed in the first article of Additional Protocol I". ICJ Opinion, 8 Jul 1996, para 84. The British government has accepted this position.

89. Geneva Convention Additional Protocol I, 1977, Article 57, para 1

90. Geneva Convention Additional Protocol I, 1977, Article 51, para 5b and Article 57 paras 2a(iii) and 3

91. ICRC Commentary on the Additional Protocols, Geneva 1987, p 683, re Article 57 para 2a(iii)

92. ICRC Commentary, p 626, re Article 51 para 5

93. "if an envisaged use of weapons would not meet the requirements of humanitarian law, a threat to engage in such use would also be contrary to that law", ICJ Opinion, 8 Jul 1996, para 78

94. The deployment of US nuclear weapons is called a threat in the US Nuclear Policy Review - "the US will continue to threaten retaliation, including nuclear retaliation, and to deter aggression against the US"

95. Declaration of President Bedjaoui, ICJ, 8 Jul 1996.

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