

Trident: Nowhere to Go

John Ainslie



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Scottish CND, 77 Southpark Avenue, Glasgow, G12 8LE. banthebomb.org 0141 357 1529

Trident: Nowhere to Go

By John Ainslie

Summary

The future of Trident has emerged as a key issue in the Scottish referendum campaign. In October 2012 the Scottish Affairs Committee of the House of Commons published a report which suggested that a vote for independence could force the UK to unilaterally disarm the Trident nuclear weapon system.¹

The Ministry of Defence (MOD) have not made plans for Trident if Scotland were to become independent. Admiral Lord West, former First Sea Lord, criticised the MOD for their failure to investigate the issue thoroughly. He said that, if he was still in post, he would have commissioned a detailed study of alternatives, even if this was contrary to ministerial guidance.²

Key questions include whether the nuclear fleet could be moved and if so to where? The UK Government have acknowledged that relocating Trident would be an enormous exercise, costing billions of pounds and taking many years to accomplish. This report argues that these problems are so great that none of the alternatives are viable.

A key factor is that submarines carry very large quantities of conventional explosives, in the form of rocket fuel for Trident missiles. An accident could result in a conventional explosion equivalent to 500 tonnes of TNT and the dispersal of 160 kilograms of plutonium. Such an accident is most likely to occur in the Explosives Handling Jetty, where missiles and nuclear warheads are loaded onto submarines, but could also happen at the Trident submarine base.

50 years ago the MOD drew up a list of possible locations for Polaris, including sites in England and Wales. Today these papers will be dusted off. Officials may also revive an option that was raised in 1981 - basing the UK Trident fleet in the United States. A second overseas possibility would be Ile Longue in France. Building a floating support ship might be a further option.

There were three English sites on the Polaris shortlist. One was Portland, near Weymouth. This was dismissed because there was no suitable location for a nuclear warhead depot nearby. Today there are houses adjacent to the required area. The site was the venue for the sailing events in the 2012 Olympics.

A second alternative was Devonport. In 1963 the MOD considered transforming part of the Cornish shore, opposite the dockyard, into a nuclear weapons' store. A modern equivalent would be far larger. It would be adjacent to a residential estate as well as being close to the city of Plymouth. It is inconceivable that this would be permitted.

The third location was Falmouth. The proposed submarine base would be on National Trust land close to St Just in Roseland. Acquiring this would be very difficult. The warhead depot would be North of Falmouth. Two villages would be so close to the depot that they would have to be abandoned. In 1963 the MOD concluded that the costs of acquiring and developing this site for Polaris would be so great that the project wasn't feasible. A Trident depot would be much larger and even less viable.

In 1963 officials proposed having the submarine base at Devonport and the armaments depot at Falmouth. Deploying Trident at these two sites would present huge problems. The plan would still mean introducing nuclear missiles into Plymouth, a city of 250,000 residents. The density of population around the naval base is such that the consequences of a missile explosion would be unacceptable. It would not be feasible to use Devonport as the operational base for Trident submarines. A nuclear missile depot close to Falmouth would also present a major safety hazard. It would ruin the tourism and watersports industries in the area and bring few long-term jobs.

1 The Referendum on Separation for Scotland: Terminating Trident – Days or Decades? Scottish Affairs Committee, House of Commons HC 676, 25 October 2012.

2 http://www.huffingtonpost.co.uk/2012/12/04/scottish-independence-defence-yes-vote-nuclear-_n_2238048.html

An existing nuclear site that might be considered is Barrow in Furness, where the submarines are built. This might be suitable if the Navy only deploys Trident when there is a full moon and a high tide. Otherwise it is a non-starter. Walney Channel is too shallow. The Barrow option was not seriously considered in 1963.

The one Welsh location on the old shortlist was Milford Haven. Siting Polaris here would have resulted in the closure of one oil refinery. Introducing Trident in this estuary today would end four major petrochemical facilities and cut off one of Britain's main sources of gas. The grounds for dismissing Milford Haven, as with all the other sites, are even stronger today than they were fifty years ago.

In 1963 each of these options was rejected. The issue was reviewed in 1979. At that time Sir Frank Cooper, Permanent Under Secretary at the MOD said it was most unlikely that they could build a replacement for Coulport on any greenfield site.³ Today, 20 years after the end of the Cold War and with growing awareness of environmental issues, the objections to such a development would be louder and more wide-ranging. As Sir Frank said three decades ago - the MOD are deluding themselves if they think they can build a new nuclear missile depot on a greenfield site.

In 1981 the MOD seriously considered "US basing" of the British Trident fleet, including nuclear warheads, to avoid the cost of expanding Coulport. However, they soon found that this ploy was fraught with problems. To comply with the Non Proliferation Treaty they would have to build unique British facilities in America. The force would also be transparently not independent.

Rather than bumping into each other in the night, British and French nuclear submarine fleets could come together and share one base in Brittany. But Ile Longue is too provide space for the separate British facilities that would be required. Britain would have to find a greenfield site somewhere else in Brittany for a nuclear base. The political problems would almost certainly be insurmountable. In their response to the Scottish Affairs Committee in January 2013, the UK Government effectively ruled out the French and American options.⁴

At various points in the 1960s and 1970s Britain considered following the American example and acquiring a support ship which could be a floating Polaris submarine depot. Implementing this today would only be possible if the MOD reverted to a 1960s approach to nuclear safety and persuaded the US Government to endorse this step back in time.

There are major obstacles to each of these options. A government which had deep pockets and which placed nuclear weapons at the top of their agenda could, with enough political will and financial commitment, find some way to relocate Trident. However the economic and political realities of today mean that none of the alternatives are practical.

It has been suggested that the Government of an independent Scotland would negotiate an agreement with London to allow Trident to remain at Faslane. However this is less likely than often claimed. A short-term lease is not an option, because, in the unlikely event that an alternative site was viable, it would take at least 20 years to build new facilities. London would want to retain total control in a Sovereign Port agreement. It would be politically very difficult for any Edinburgh government to accept this. The SNP have made it clear that they would reject any such proposal.⁵

The future of Trident is already under serious doubt. Acquiring a replacement for Trident would put severe pressure on the defence budget. The Liberal Democrats have rejected the option of a like-for-like replacement. Two former defence ministers have dismissed the concept of "Continuous At Sea Deterrence" which lies at the heart of Trident. The combination of these doubts and the prospect of Scottish independence could produce the perfect storm which will sweep away the British nuclear weapons' programme.

If an independent Scotland insisted that Trident must be removed then this would probably result in there being no nuclear weapons in Britain. This is something which many people in Scotland, England, Wales and the rest the world would welcome. Those who call for a nuclear-weapons free Scotland cannot be accused of taking a "Not In My Back Yard" approach. Removing Trident from Scotland and Britain could give a new push to global efforts towards a nuclear-weapons free world.

3 Coulport and Successor Systems Richard Mottram PS/PUS 13 July 1979 The National Archives (TNA) DEFE 24-2122 e53. Thanks are due to Brian Burnell for his research into National Archive records on the British nuclear weapons programme.

4 Government response to Scottish Affairs Committee, 8 January 2013

5 Deputy First Minister Nicola Sturgeon giving evidence to the House of Commons Foreign Affairs Committee, 28 January 2013, Press Association 29 January 2013

Safety and Polaris/Trident site selection

Safety issues

The MOD's risk assessment for an accident involving an armed Trident submarine in the Faslane shiplift assumes that the detonation of one missile would result in the explosion of all the missiles on a submarine and the dispersal of plutonium from all the nuclear warheads onboard.⁶ Consequently at any site where there is a fully-armed submarine there is the risk the detonation not just of a single missile, but of all the missiles on the vessel. The rocket fuel on a Trident D5 missile is equivalent to over 70 tonnes of TNT.⁷ British Trident submarines now each carry 8 missiles. The total explosive power of these 8 missiles is equivalent to 560 tonnes of TNT.

In 1965 the United States detonated conventional explosives, equivalent to 500 tonnes of TNT, in Operation Sailor Hat. This test was to simulate the effect of a small nuclear explosion. Three redundant navy ships, anchored nearby, were badly damaged. The video of the test provides a graphic illustration of the effect of an explosion of this scale.⁸ The accidental detonation of Trident missiles would be a far greater hazard than just a massive explosion. The shiplift assessment assumes that all of the plutonium in all of the warheads would be dispersed. A submarine carries 40 warheads, each containing around 4 kg of plutonium. In an accident 160 kg of plutonium would be dispersed. There would also be a risk of a low yield nuclear explosion, although this is dismissed in the MOD's assessments.

The official fault trees show that a missile might detonate as a result of an explosion in the submarine's nuclear reactor. However, they ignore the possibility that a missile explosion could rupture the integrity of the reactor circuit. In either case, radioactive material from the reactor would be dispersed into the atmosphere. The MOD's assessment only modelled the dispersal of warhead plutonium. It ignored nuclear material from the reactor.

The nuclear warheads are located in a circle around the third stage of the D5 missile. This is recognised as a major safety issue in the Trident design. The US Navy adopted this arrangement for the first time with Trident C4, to increase the range of the missiles. It was then used, for the same reason, on Trident D5.



Operation Sailor Hat 1965



Conical nuclear warheads around the 3rd stage of a Trident C4 missile. D5 has a similar arrangement.

- 6 A Radiological Probabilistic Risk Assessment of the Faslane shiplift for Vanguard Class Submarines with Strategic Weapon System Embarked, AWE, 2000, and Accident Probability Assessment of Faslane Shiplift for Vanguard Class Submarines with Strategic Weapon System Embarked, 2000. Both were released to Scottish CND under the Freedom of Information Act. After an internal review, most of the figures in these documents were released, but a few remain redacted.
- 7 US Government Bill of Lading GBL G-4432893, 1 September 1988, quoted in Trident D5 Missile Explosive Propellant Hazards, Glen Milner, Ground Zero Campaign, July 2001
- 8 Operation Sailor Hat 1965 US Navy video http://www.youtube.com/watch?v=ZVM9_attO1Q

If one warhead collides with the third stage motor then there is a one-in-two chance that this will trigger an explosion, not only of this missile, but of all 8 missiles on the submarine. This is the MOD's "best estimate". Their "pessimistic estimate" of probability is one, i.e. it should be assumed that the missile will detonate.⁹

The risk assessment for the Faslane shiplift considers the probability of a warhead colliding with the third stage if the shiplift collapses. Such a collision is more likely in the Explosives Handling Jetty (EHJ) while warheads are being fitted onto a missile or removed from one. While there is the risk of a missile explosion at a Trident submarine base, this hazard is even greater at the nuclear weapons depot.

Site selection for Polaris and Trident

An account of how the MOD decided to base Polaris at Faslane is given by Malcolm Chalmers and William Walker in *Uncharted Waters: the UK, nuclear weapons and the Scottish question*.¹⁰

A nuclear-armed submarine fleet needs two shore facilities. The first is a base to berth and support the submarines. The second is a nuclear armaments depot to store and handle warheads and missiles. Finding a suitable site for the latter is particular difficult.

Nuclear armaments depot

When the MOD were considering where to put Polaris, their requirement was that the armaments depot should be 4,400 feet (1.34 kilometres) from any significant area of housing and one mile (1.6 kilometres) from the submarine base.¹¹ The Polaris depot at Coulport, built on this basis, occupied an area of 128 hectares.¹² By 1979 the safety criteria had changed:

"The rules for establishing protection from explosives by laying down 'quality distances' from such explosives – whether in magazines or process buildings – to inhabited buildings and public roads, were changed after the Coulport complex was constructed. As a result, waivers have had to be granted to enable some of the existing buildings to be used."¹³

This suggests that the old Polaris area in Coulport was not sufficiently far from inhabited buildings and public roads to comply with the criteria which applied in the 1970s.

In 1979, as the MOD looked at the implications of acquiring Trident, they realised that there would be two major problems at Coulport. Firstly, the new missiles would have more explosive power than Polaris and so they could not use the existing facilities. Secondly, the new bunkers would have to comply with the new safety criteria which required greater separation from residential properties.

The issue was considered by officials at the top of the MOD. Richard Mottram, Private Secretary to the Permanent Under Secretary, pointed out that this was "one of the most difficult technical areas which we need to explore."¹⁴ Michael Quinlan, Deputy Under Secretary (Policy), said "we would face complex and perhaps very serious problems over accommodating it at Coulport with present explosives regulations".¹⁵ The MOD drew up a plan to expand Coulport to 1067 hectares, eight times its original size.¹⁶ Under this proposal they would have been maintaining as well as storing missiles, as had been the case with Polaris.

9 Accident Probability Assessment of Faslane Shiplift for Vanguard Class Submarines with Strategic Weapon System Embarked, 2000

10 *Uncharted Waters: The UK, nuclear weapons and the Scottish question*, Malcolm Chalmers and William Walker, Tuckwell Press, 2001 <http://www.amazon.co.uk/Uncharted-Waters-Nuclear-Scottish-Question/dp/1862322457>

11 Naval Ballistic Missile Force: Report of Working Party established by SMBA 5268, 25 February 1963, TNA ADM 1-28965 (Working Party Report); *Uncharted Waters* Chalmers and Walker.

12 http://hansard.millbanksystems.com/written_answers/1981/jul/14/trident-coulport-base

13 Successor system to Polaris JF Howe DFA(P) 5 June 1979 TNA DEFE 24-2122 e28

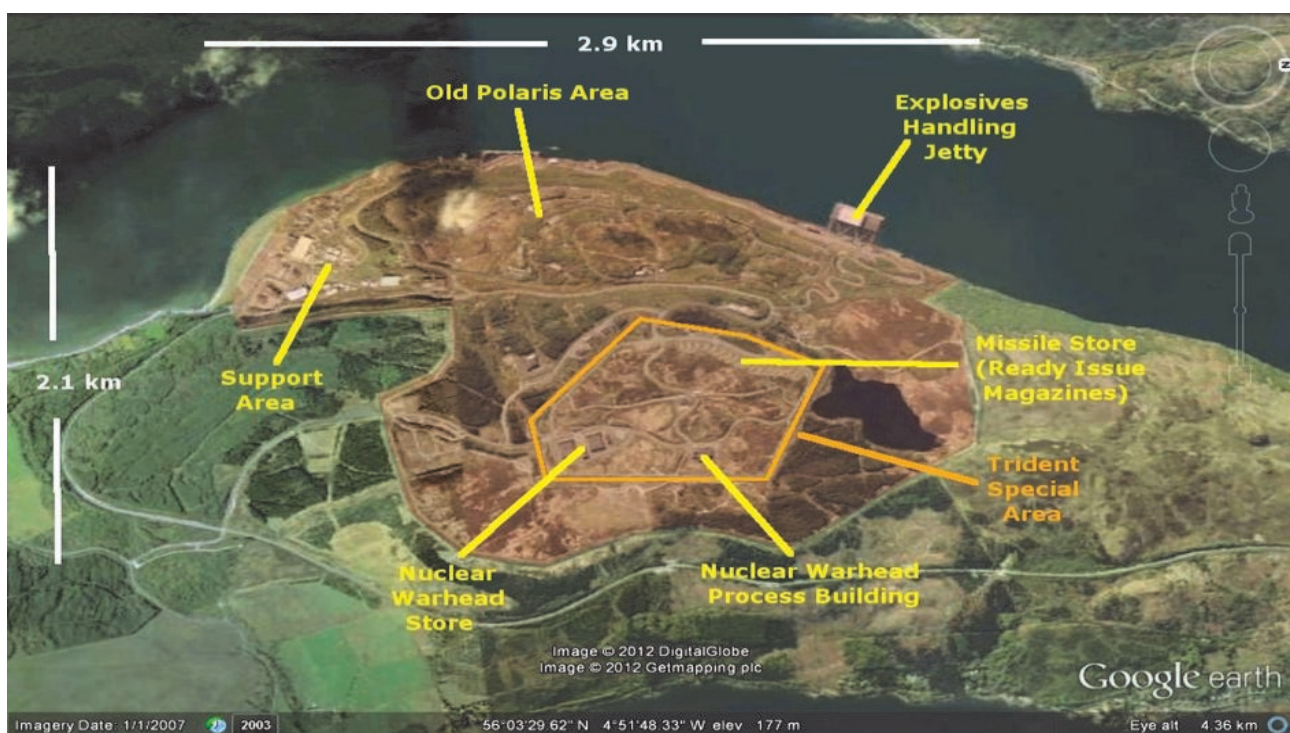
14 Nuclear Matters: Questions for the USA, Richard Mottram PS/PUS 6 July 1979 TNA DEFE 24-2122 e46

15 Coulport and Successor Systems Michael Quinlan DUS(P) 11 July 1979 TNA DEFE 24-2122 e52

16 http://hansard.millbanksystems.com/written_answers/1981/jul/14/trident-coulport-base

At that time Mrs Thatcher's government had been intending to buy the Trident C4 missile. In 1982 they opted to purchase the much larger D5 missile instead. The problems with Coulport became far greater. As a result the government decided to transfer missile maintenance work to the United States.¹⁷ There was still a requirement to handle and store D5 missiles and their nuclear warheads at the Loch Long depot. Even though Coulport would no longer be overhauling missiles, the depot still had to be expanded to three times its original size. The site is 2.9 kilometres from East to West and 2.1 kilometres from North to South.

The explosive safety criteria meant that the buildings had to be separate from each other and far from public areas. The Explosives Handling Jetty (EHJ) at Coulport, which loads and unloads missiles and warheads from submarines, is 800 metres from other facilities. Within the high-security Trident Special Area there are three compounds - Ready Issue Magazines for missiles, nuclear-warhead storage and a nuclear-warhead processing building. These three facilities are each 400 metres apart. The Ready Issues Magazines are a series of bunkers, each of which can take one Trident missile. The bunkers are 27 metres apart to reduce the risk that the detonation of one missile would result in the explosion of others.



Trident nuclear missile and warhead depot Coulport

Most of the logistical and support facilities in Coulport are more than 1 kilometre from the Trident Special Area and the EHJ. In addition to the large area of the base itself there is a wider zone around it within which there are very few residential buildings.

There are similar separation distances, between facilities and from public areas, at the American Trident bases at King's Bay in Georgia and Bangor in Washington State. The US Navy is building a new Explosives Handling Jetty for Trident at the Bangor base. Anti-nuclear campaigner Glen Milner has been trying for 7 years to obtain information on the explosives' safety distances associated with this development. Despite a ruling from the Supreme Court in Milner's favour, the Department of Defence have still not released the data. They are currently trying to introduce legislation in Congress to block the disclosure.

¹⁷ A detailed proposal to transfer Trident C4 missile maintenance work to the US had already been drafted. The only issue had been whether this would be an interim or permanent arrangement.



Coulport - Ready Issue Magazines



Coulport - Reentry Body Magazines

In drawing up their long-term plans for nuclear weapons, the MOD assume that safety regulations may be tighter in future than they are today. The safety distances which lay behind the design of the Trident area at Coulport are likely to be a minimum. Spacing between facilities and separation from built-up areas would probably have to be greater than at Coulport. Reductions in missile numbers might mean that the number of Ready Issue Magazines was reduced from 16 to 8. The smaller nuclear warhead stockpile might be incorporated in one magazine building rather than two. However these reductions would be offset by increased spacing distances and are unlikely to have a significant effect on the overall size of the area required for a depot.

The Coulport depot today takes up an area of 364 hectares. It has 32 kilometres of internal roads and 30 kilometres of alarmed fence.¹⁸ Allowing for the fact that the present site includes the old Polaris Special Area, a new depot would probably require around 300 hectares. This is equivalent to a rectangle of 1.5 kilometres by 2 kilometres.

When revisiting the alternative locations considered in 1963 it is important to bear in mind that a Trident depot would be more than twice the size of the Polaris depot that was originally envisaged, and that separation distances from inhabited areas would be greater.

Trident Submarine base

Safety is a major consideration in the siting of the submarine base as well as the armament's depot. A support base would have a shiplift or drydock for submarine maintenance. Current practice is to lift fully-armed Trident submarines in the Faslane shiplift. This introduces substantial risks. In addition, Power Range Testing of reactors is carried out at the berths. A Trident submarine presents a particularly complex cocktail of risks. It combines high-explosive rocket fuel, nuclear warheads, torpedoes and a nuclear power plant.

The shiplift risk assessment reveals that a missile explosion is a possible accident at a Trident submarine base. There is the potential that this could lead to the dispersal of around 160 kilograms of plutonium and possibly radioactive material from the reactor.

¹⁸ http://www.mod.uk/NR/rdonlyres/B1415470-BC8B-47E1-90C0-E206AF6748A0/0/tt133_dec07.pdf

1963 Polaris assessment

The MOD considered five factors: (1) Ease of submarine operations; (2) Safety; (3) Logistics; (4) Ownership, development costs and planning permission; and (5) Overall cost. Chalmers and Walker suggest that a sixth factor should be introduced – the political risk at local, national and international level of pursuing particular options.¹⁹

Sites on the East coast of England were ruled out because they were too far from the deep water of the Atlantic where submarines could avoid detection. The effect of this was to focus on the Celtic fringe – Scotland, Wales and Cornwall. Harland and Wolfe shipyard in Belfast was considered but was not a serious contender. For political as well as practical reasons it would not be pursued today. Sites on islands or remote locations were eliminated in 1963 because providing logistical support would be difficult.

After an initial wide review of options, the study shortlisted 10 sites for detailed consideration. Six of these were in Scotland. There was one site in Wales (Milford Haven) and three in England (Devonport, Falmouth and Portland).

Greenfield sites

It is highly questionable whether the MOD could successfully introduce nuclear weapons and nuclear submarines to a new site. In 1979, when drawing up their plans for Trident, the MOD had doubts about whether Coulport could be adapted for the new missile system.²⁰ Michael Quinlan said “A new ‘greenfield’ site in the UK should I suggest, be assumed as a last (but not impossible) recourse.”²¹ Frank Cooper, Permanent Secretary at the MOD, replied that “while nothing is impossible, it is most unlikely that we would ever get agreement to a new ‘greenfield’ site in the UK”.²² He added that the MOD should not delude themselves into thinking that a greenfield site was acceptable.²³

19 Uncharted Waters Chalmers and Walker

20 Successor system to Polaris JF Howe DFA(P) 5 June 1979 TNA DEFE 24-2122 e28

21 Coulport and Successor Systems Michael Quinlan DUS(P) 11 July 1979 TNA DEFE 24-2122 e52

22 Coulport and Successor Systems Richard Mottram PS/PUS 13 July 1979 TNA DEFE 24-2122 e53

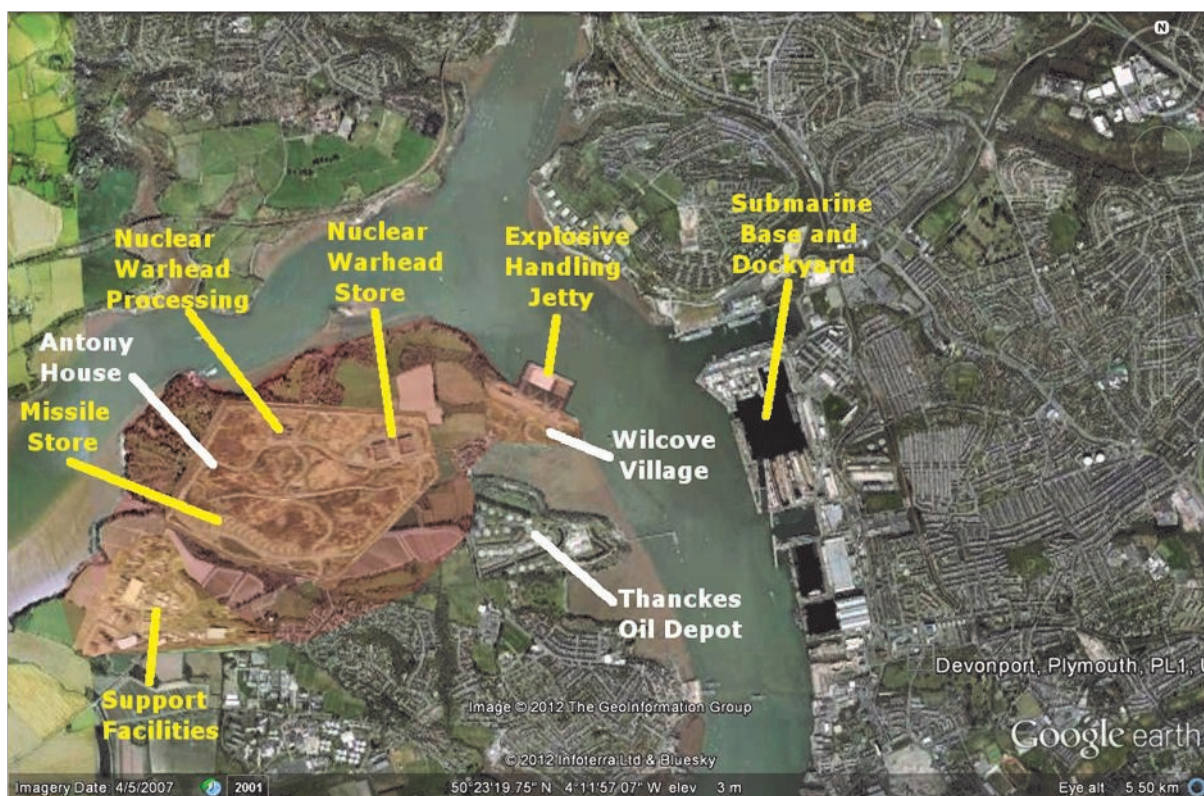
23 “We should not delude ourselves that showing the difficulties in all other alternatives will lead to the conclusion that a ‘greenfield’ site is acceptable”. TNA DEFE 24-2122 e53

Relocation options in England and Wales

The examples below show the impact of moving Trident to the sites proposed for Polaris in 1963. The illustrations impose satellite images of Faslane and Coulport onto each location.

1. Trident submarine base and nuclear warhead store in Devonport

At first glance, the most obvious alternative for Trident would be Devonport. Refits of Vanguard class submarines are carried out in Devonport Dockyard. Devonport Naval Base has been the home to Trafalgar class submarines which are nuclear powered but not nuclear armed. The site is due to cease being an operational submarine base when the last Trafalgar class submarine leaves in 2017.



Areas required for a nuclear armaments depot and Trident submarine bases at Devonport

Nuclear warhead store in Devonport

In 1963 the proposal was to build a nuclear armaments depot for Polaris on the Cornish side of the Tamar at Wilcove.²⁴ There was concern about the response from the National Trust, who own Antony House.²⁵ The Polaris plan would have come close to this historic property. The Trident proposal, needing twice as much land, would completely swallow up Antony House and its grounds.



Antony House

²⁴ Working Party Report as outlined in *Uncharted Waters* Chalmers and Walker

²⁵ Antony House was the setting of the Tim Burton film *Alice in Wonderland*. <http://www.nationaltrust.org.uk/antony/>

The MOD had been concerned that the proposed Polaris depot would be too close to the village of Wilcove. A larger Trident depot would take over the village, which would have to be abandoned. There would be further problems with the housing estate near HMS Raleigh, as this would be immediately next to the nuclear depot. A Trident nuclear warhead depot on this site is not viable, because there is not sufficient space for the required separation from housing and because of the very high population, 250,000, in the immediate area. The proposed site could not meet the 1963 criteria of maintaining a gap of 1.34 kilometres from residential property, far less today's requirements.

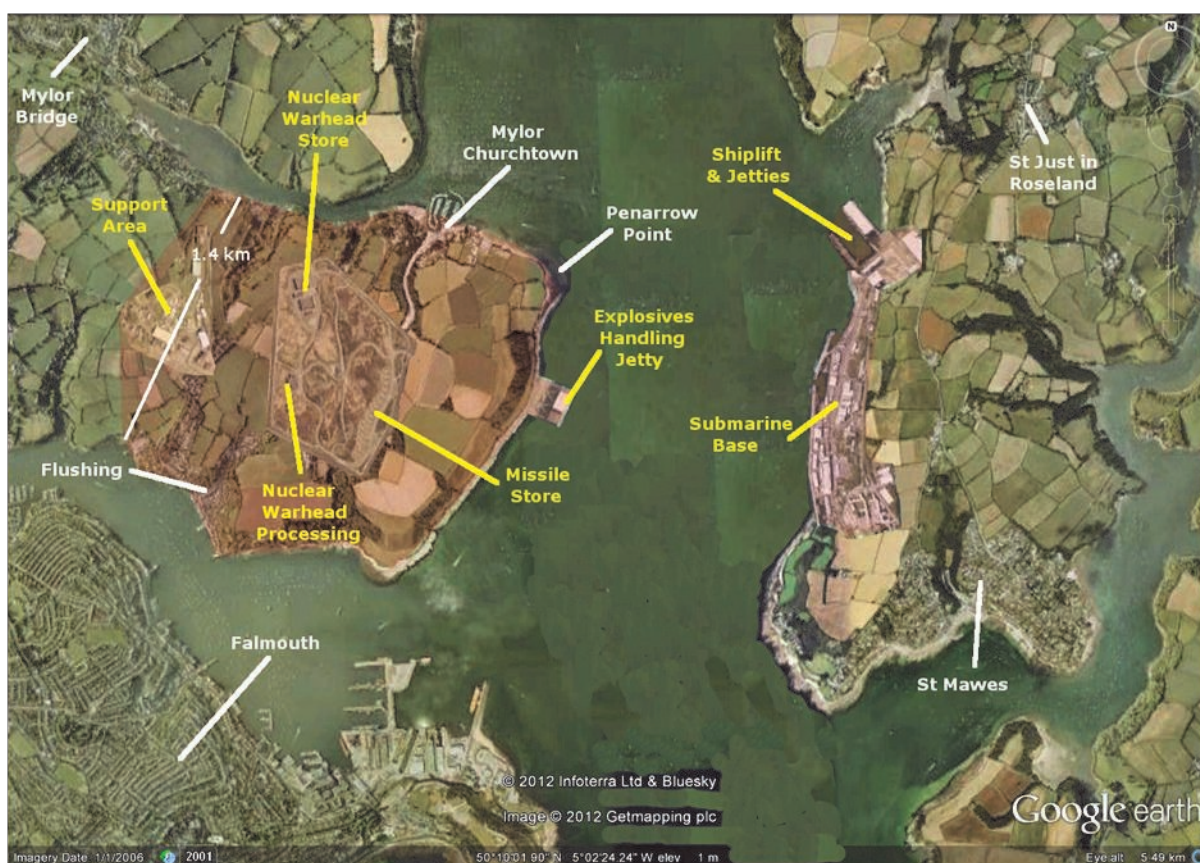
The Nuclear Installations Inspectorate and their successors, the Office of Nuclear Regulation (ONR), have approved the development and continued use of nuclear refuelling facilities at Devonport. However they are aware that the siting of this nuclear facility in a major urban area is contrary to normal practice. It is inconceivable that the ONR would approve the construction of a new nuclear missile depot so close to a city.

Another problem that was identified in 1963 was the proximity of the MOD Thanckes Oil Depot. If a large Trident facility was built at Wilcove then the oil depot would have to close. The MOD would be forced to find an alternative location where they could build a fuel depot for the ships at Devonport.

The issue of using Devonport as a Trident submarine base is considered in option 3, below.

2. Trident submarine base and nuclear warhead store at Falmouth

The 1963 proposal was to build a nuclear armaments depot near Penarrow Point and a submarine base on the opposite side of the estuary between St Just in Roseland and St Mawes.²⁶ The Google Earth image below superimposes Faslane and Coulport on these two sites to indicate what a nuclear base at Falmouth would look like.



Areas required for a nuclear armaments depot and Trident submarine base at Falmouth

Whereas the Polaris proposal would have taken up the land around Penarrow Point, a Trident armaments depot would swallow up the whole peninsular, including the villages of Mylor Churchtown in the North and Flushing in the South. The depot would also extend to the West, towards Penryn and Mylor Bridge.

The depth of the Fal estuary restricts where it would be possible to build the Explosives Handling Jetty and submarine berths. There is deep channel which zig-zags across the estuary.²⁷ The key facilities could only be sited where this channel is close to the shore, South of Penarrow Point on the Western shore and near St Just in Roseland on the Eastern shore. Other parts of the shoreline are too shallow.

Nuclear warhead store at Falmouth

The population of Falmouth, around 20,000, is similar to Helensburgh, the nearest town to Faslane. However, whereas Helensburgh is 7.4 kilometres from the Faslane shiplift and 8 kilometres from Coulport, Falmouth would be 500 metres from the boundary of the nuclear warhead depot.

In addition to the explosives safety zone, there would be a wider area within which there would be preplanned countermeasures for a nuclear accident. This would extent to 2 kilometres from the nuclear facilities in the depot and would include a large part of Falmouth. The proximity to the town would almost certainly rule out building a nuclear warhead depot on the site proposed in 1963.

The Explosives Handling Jetty (EHJ) would be 800 metres South East of Mylor Churchtown. The missile and warheads buildings would be a similar distance from the village. Mylor Churchtown is a significant sailing centre with 400 pleasure craft at the marina and nearby moorings. It is home to Restronguet Sailing Club, where the triple-Olympic Gold medallist Ben Ainslie learned to sail. The EHJ and bunkers would be so close that the village and surrounding area would have to be evacuated. The marina, sailing club and moorings would all be abandoned. Many of the houses between Mylor Churchtown and Mylor Bridge could no longer be inhabited. People living in Flushing would also have to leave their homes as they would be too close to the nuclear bunkers. The peninsula is between 1.4 kilometres and 2 kilometres in width. Wherever the nuclear facilities were placed on the peninsula, they would be too close to both Mylor Churchtown and Flushing. Both villages would have to be abandoned.

At Coulport there is a Restricted Area of water 700 metres from the shore and a Protected Area 250 metres from the shore. Pleasure craft which sail close to the nuclear depot are intercepted by MOD Police patrol boats and warned to keep clear. If a similar zone was imposed around a nuclear depot in the Fal estuary then it could affect 581 moorings in Falmouth Harbour. The moorings would be on the perimeter of a high-security nuclear-weapons facility and many would have to be abandoned. The owners would find it very difficult to find alternatives. There is a five year waiting list for moorings in the area. In addition, a large number of boats are stored on shore in Ganges Close, Mylor Churchtown. This area would be near the centre of the nuclear weapon store and no longer available as a dinghy park.

There is currently a major plan to redevelop Falmouth harbour. It includes the construction of a terminal for cruise liners. There are proposals to dredge the approach to the harbour as part of this plan.²⁸ It has been suggested that this may be a Government initiative to prepare Falmouth for Trident. However the scheme was initiated prior to 2008, well before Whitehall was giving any serious attention to the impact of Scottish independence on Trident. The development of a cruise liner terminal is not compatible with building a nuclear warhead store. It would place thousands of passengers within a few hundred metres of a nuclear site.

Falmouth has its employment problems, but Trident would not provide the answer. Tourism, particularly watersports, is a major part of the local economy. The loss of 1,000 pleasure craft would be a significant blow to the area, complemented by the blight of a nuclear weapons' base.

27 <http://www.visitmyharbour.com/viewchart.asp?chart=16D26C3458CF22320>

28 The dredging plans have been criticised because of their impact on the marine environment.



Mylor Churchtown



**Explosives Handling Jetty
(Coulport)**

Submarine base at Falmouth

The 1963 proposal was to build the Polaris submarine base on the Eastern shore of the estuary, North of St Mawes, with a floating dry-dock close to St Just in Roseland. This section of coast is owned by the National Trust, as part of their commitment to protect the British coastline. Officials in the MOD assumed that the National Trust would object to their proposals for Polaris and that there would be public backing for the Trust's stance. This was a significant factor in their elimination of the Falmouth option.

The MOD were also concerned that the Duchy of Cornwall, which owns all the foreshore and some of the land, might also block their proposal. Prince Charles might find himself torn between his affinity with the Royal Navy and his promotion of produce from the pristine environment of Cornwall.

3. Trident submarine base at Devonport and warhead store in Falmouth

Faced with the difficulty of finding a suitable site for a nuclear armaments depot in Devonport, the 1963 review considered the possibility of combining Devonport and Falmouth. Devonport could house the submarine base and Falmouth the nuclear armaments depot. The MOD rejected this arrangement because it would "stretch to an unacceptable degree the requirement for proximity of the operating base and the RNAD".²⁹ They insisted that the ammunitions depot should be within one hour's sailing of the submarine base. Falmouth is 70 kilometres West of Devonport.

A two-base option for Trident was supported by Dr Jeremy Stocker, a Commander in the Royal Navy and associate fellow at the Royal United Services Institute. In his evidence to the House of Commons Defence Committee in 2006 he said: "If the [nuclear deterrent] had to be relocated, the only viable base is Devonport, with a new RN Armament Depot probably at Falmouth."³⁰

Chalmers and Walker suggest that, with the lower tempo of nuclear submarine operations today, splitting the facilities between these two sites might be more acceptable than it was in 1963. This raises the issue of keeping submarines on patrol. Former Defence Ministers Lord Browne and Lord King have argued that Britain should end its Cold War posture of having one Trident submarine on patrol at all times. However the submarine service is resisting this move. They fear that the rationale for Trident will unravel if continuous patrols are ended.

²⁹ Working Party Report as outlined in *Uncharted Waters* Chalmers and Walker.

³⁰ <http://www.publications.parliament.uk/pa/cm200607/cmselect/cmdfence/ucwhite/ucm402.htm>

Trident submarine base at Devonport

In October 2012 the MOD admitted, in response to a Freedom of Information request, that the safety cases for Devonport Naval Base and Devonport Dockyard do not permit the berthing of a Vanguard class submarine if it is carrying Trident missiles. They also revealed that they have not carried out a detailed assessment of the risk of introducing Trident missiles into the base or dockyard. In January 2013 Scottish CND published their own assessment of the risks of this proposal, based on MOD documents and American government software which models the effects of nuclear weapons' accidents.³¹ The MOD's own regulations show that a missile explosion could result in residents receiving a lethal radiation dose of between 1 and 100 Sieverts if they are 1 kilometre from the submarine. While there are no residents living this close to the Trident berths at Faslane, there are over 4,000 people within this distance of the berths at Devonport. Scottish CND's computer modelling suggests that in average weather conditions there would be 800 additional long-term cancers and 16% of the city of Plymouth would be contaminated to an unacceptable level. There would also be casualties from blast damage. In calm conditions there could be as many as 11,000 fatalities.

The Office of Nuclear Regulation (ONR) and the Defence Nuclear Safety Regulator (DNSR) are obliged to consider population density when assessing any new nuclear development. Nuclear activity at Devonport is declining. Nuclear refuelling work will shortly cease. The current plan is that there will be no operational nuclear submarines based at Devonport after 2017. Basing Trident here would not only reverse this trend, but would introduce an unacceptable new risk to the city of Plymouth.

A further problem with Devonport is that it is difficult for large submarines to access the base. The Trafalgar class submarines, which currently use the base, are much smaller than the Trident-armed Vanguard class. Vanguard class submarines enter and leave the port at the start and end of long refits. However, these journeys can only take place at high tide. Even in these tidal conditions, the channel is closed to all other shipping while the Trident submarines enter and leave. These restrictions would be an unacceptable constraint at an operational Trident base.

Nuclear Armaments Depot at Falmouth

The problems of introducing nuclear missiles to Falmouth were outlined in the Falmouth section above. In addition, if Falmouth was only to become a nuclear warhead store, then the area would be faced with the blight of hosting nuclear weapons and the loss of a large area of land, without the jobs associated with a submarine base. There would be some short-term jobs building the depot, but most of the long-term posts would go to Devonport. The positions available at the nuclear missile depot would be mostly security jobs – armed police telling visitors that they can't go along their favourite walk or sail too close to the shore.

For the above reasons, there are major problems with the Devonport-Falmouth option.

4. Portland (Weymouth)

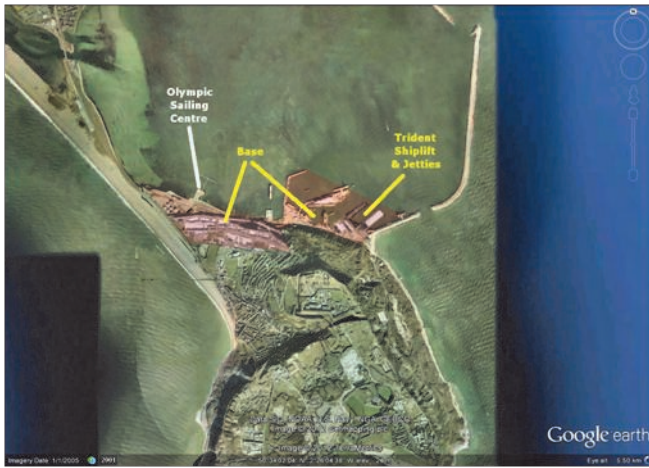
Portland Naval base was on the shortlist for Polaris.³² The naval base closed in 1995 and the neighbouring Naval Air Station shut down 4 years later. The site of the Naval Air Station has been given a new lease of life as Osprey Quay with new residential, commercial and marina developments. Osprey Quay is home to the UK national sailing centre, which hosted the sailing events in the 2012 Olympics.

There is not enough suitable land on the site of the old Naval base itself. A Trident submarine base would also take over the site of the old Naval Air Station. This would mean demolishing the Osprey Quay development, including the Olympic sailing centre. There are both new and older residential properties in this area. Some of these would fall within the boundaries of a new nuclear base and others would be immediately adjacent to it.

The Portland option was dismissed for Polaris because no suitable site for a nuclear armaments depot could be found in the surrounding area. The lack of suitable spacing from residential areas means that Portland would not be a viable site for a Trident base today.

31 Risk from Trident Missiles in Devonport, Scottish CND, January 2013
<http://www.banthebomb.org/images/stories/pdfs/RiskfromTridentmissilesinDevonport.pdf>

32 Working Party Report as outlined in *Uncharted Waters*, Chalmers and Walker



Area required for a Trident submarine base at Portland (Weymouth)



Olympic sailing venue Portland (Weymouth)

5. Milford Haven

The one Welsh site on the 1963 shortlist was Milford Haven. The proposals were to build a nuclear missile depot to the East of Shore Point and to transform the MOD mine depot at Newton Noyes into a submarine base. At the time Esso had just established one oil refinery in Milford Haven. The MOD concluded that Polaris and the refinery were incompatible, on safety grounds. The only way that the submarines could be accommodated would be if the oil terminal was closed.



Areas required for a nuclear armaments depot and Trident submarine bases at Milford Haven

In 2012 Welsh First Minister Carwyn Jones said that he would welcome Trident to Milford Haven if it left Scotland. His stance was criticised, not only by Plaid Cymru but also by Welsh Labour Assembly Members and MPs. In January 2013 the MOD said they had not looked into the safety of basing Trident at Milford Haven.

Today Milford Haven has two terminals which offload Liquefied Natural Gas (LNG) from tankers. These handle 30% of the UK's gas supply. In addition there are two oil refineries and a large tank farm, which process 25% of Britain's petrol and diesel.

The proposed submarine base would be next to one of the LNG terminals and the tank farm. Submarines would pass within 250 metres of three petrochemical jetties to approach the site which had been identified as a potential submarine base in 1963. A missile explosion on a Trident submarine could trigger a petrochemical explosion. In addition, an explosion on a tanker or jetty handling LNG or oil could develop into a nuclear incident, because of the risk that it could trigger a fire or explosion on a submarine.

It would not be possible to base Trident here while the oil and gas facilities were still functioning. Closing the petrochemical plants would have a major impact on the British economy. So putting Trident in Milford Haven is not a viable option.



Milford Haven Refinery



**HMS Repulse aground in
Walney Channel 1967**

6. Barrow

The only places which are seriously considered for new civil nuclear power stations are existing nuclear sites. Likewise the shortlist for the disposal of decommissioned submarines was narrowed down to existing defence nuclear facilities. Taking this approach, there would appear to be one other option in England – Barrow in Furness, where nuclear submarines are built.

Barrow did not make it onto the 1963 shortlist because it is not a suitable location for an operational submarine base. Walney Channel is too shallow. In 2005 the RAND Corporation carried out a detailed investigation into the possibility of relocating the initial fuelling of nuclear submarines from Barrow to Devonport. This would involve towing newly-built vessels between the two dockyards. The RAND report explains the tidal problems in Walney Channel. There are a limited number of hours in each month when the tide is high enough for a nuclear submarine to transit the Channel into the open sea. Even at these restricted times the vessel has to travel faster than 8 knots to complete the journey in the short window at high tide.³³

Tidal problems are not an abstract issue. The second Polaris submarine to be built at Barrow, HMS Repulse, ran aground in Walney Channel when it was launched on 11 November 1967.

To the West of Walney Island there is deeper water, but this area is exposed to the prevailing South Westerly wind. The sheltered Eastern side of the island is too shallow for a submarine base. The construction yard is reached from sea through a lock gate. A further problem with Barrow is the proximity of any facility to the town itself.

33 The United Kingdom's Nuclear Submarine Industrial Base, Volume 3 Options for Initial Fuelling, R Raman et al, RAND Corporation for the Ministry of Defence, 2005

Overseas options

General points

There are three problems which undermine the American and French basing options. The first is the Non Proliferation Treaty (NPT). Article 1 of the treaty says:

“Each nuclear-weapon state party to the treaty undertakes not to transfer to any recipient whatsoever nuclear weapons or other nuclear explosive devices or control over such weapons or explosives devices directly, or indirectly”.

This means that if British nuclear weapons were operating from a base in the United States or France they would have to remain under absolute British control at all times. The MOD might be tempted to think that they could save money by using American or French facilities. However, if they are to comply with the Treaty, they would have to construct duplicate buildings. This would clearly be the case with regard to the magazines and process buildings for nuclear warheads and the Ready Issue Magazines for armed missiles. The principle could also be extended to missile handling facilities. Currently the Explosives Handling Jetty at the US King’s Bay depot from time to time loads unarmed Trident missiles onto British submarines. However, it does not handle British nuclear warheads.

The second issue is dependence. The value of British nuclear weapons as a symbol of greatness is bound up with perceptions that the force is independent from foreign control. This is to a large degree a myth. Faslane only keeps 12 months’ supply of certain key missile components. This dependence would be brought to the fore if the fleet was based overseas.

The third factor is the public response in the host country. Accommodating the nuclear weapons of a foreign power would be controversial. Obtaining consent would prove even more difficult than in the UK. The UK government response to the Scottish Affairs Committee summarised these problems:

“Operations from any base in the USA or France would greatly compromise the independence of the deterrent and there would be significant political and legal obstacles.”³⁴

United States of America

In 1980 the Thatcher government agreed to purchase the Trident C4 missile system from the United States. The following year officials concluded that there was no long term future for C4 and that Britain should purchase the larger D5 missile. One consequence of this change was that the costs of Trident would far exceed the initial budget. So the MOD considered how to reduce expenditure. One big item was the expansion of Coulport. Officials proposed two options. The first was to move missile servicing work from Coulport to the US. This was agreed and is current practice. The second, more radical, option was to move both missile and nuclear warhead work from the Loch Long depot to the United States. The warheads would still have been made at Aldermaston, but they would have been stored at the US Navy Trident Base at King’s Bay in Georgia. Routine servicing and mating of warheads with missiles would have taken place in America. The extent of the plan is revealed in this description of the proposal:

- a. To transfer missiles with warheads from SSBNs to US storage and processing facilities; and back to the SSBNs
- b. To mate and demate the warheads and missiles on US soil
- c. To test the warheads and replace lifed items
- d. To transfer warheads, in transit containers, from the US to UK, for surveillance, update and repair, and to replace them with others for outloading to our SSBNs.”³⁵

34 The Referendum on Separation for Scotland: Terminating Trident—Days or Decades?: Government response to the Committee’s Fourth Report of Session 2012-13, Scottish Affairs Committee, House of Commons, 8 January 2013

35 Trident: Processing D5 missiles in the US, M Gainsborough, 20 November 1981, TNA DEFE 24-2123 e6

Officials pointed out that all work would have to be under UK control, to comply with the NPT:

“As this would imply actual work on the warheads, unless the whole operation were under British control at all times, it could be regarded as contravening the Treaty’s provisions.”³⁶

The British Embassy in Washington gave their view on compliance with the NPT and the likely American response:

“since warheads would be involved, rather than, as previously, missiles without warheads, we should, *prima facie*, appear to be sailing closer to the wind in terms of Article I than has hitherto been the case (and there certainly are those in Congress who would see such an arrangement in that light)”.³⁷

There was concern that the arrangement might not comply with the US Atomic Energy Act 1954 which precludes the US from exporting nuclear warheads to other countries. The Embassy felt that there could be problems over safety and control of warheads.

They pointed out that, although Defence Secretary Casper Weinberger was sympathetic, support was not universal:

“there are others who are less well disposed and who in due course will begin to question to what extent it is in the US interest to enable us to continue to maintain an ‘independent’ nuclear capability so heavily reliant on US facilities.”³⁸

The discussion on this issue reveals the considerable extent of dependence in any case:

“it may be that much harder to convince the sceptics that the system remains in a real sense ‘independent’ when the warheads themselves are stored, loaded and off-loaded in the United States. Although there is in real terms a substantial measure of dependence now, it would be hard to counter the impression that the maintenance, operation and even the continued existence of the UK deterrent were increasingly becoming matters within the discretion of the US government of the day.”³⁹

These files show that the Royal Navy only maintains sufficient spares to sustain the Trident system for 12 months.⁴⁰ There are a number of vital missile components, in the guidance and flight control systems, which are replaced on a regular basis.⁴¹ These can be accessed from inside the submarine. The UK only holds one year’s supply of these parts. Whether based in Britain or the United States, the UK cannot continue to operate its nuclear weapons for more than 12 months if Washington withdraws its support. The Government was concerned that basing the fleet in the US would affect the perception of independence. Handling British nuclear warheads at King’s Bay would raise public and international awareness of the extent of dependence. It would also result in discussions in Congress which were best avoided.

In January 2013 the UK Government acknowledged that King’s Bay did not provide an easy solution. A report to the Scottish Affairs Committee said, “to use facilities at King’s Bay in Georgia USA would present a complex logistic and cost challenge”.⁴² Journalist Elaine Grossman interviewed US naval expert Norman Polmar about the possibility of operating the British fleet from King’s Bay. She wrote: “Polmar said the logistics of basing British submarines at King’s Bay would be so challenging as to rule out the option entirely.”⁴³

Any review of future locations for the UK Trident fleet is likely to include this “US-basing” option. Financial savings would be an illusion, given the need to build unique British facilities on an American site. Moving to an American base would raise awareness, in Britain, America and around the world, of how the British force is dependent on US support.

36 Trident: Processing D5 missiles in the US, TNA DEFE 24-2123 e6

37 Processing of UK Trident missiles in the US, MJE Fretwell, British Embassy Washington, 9 December 1981 TNA DEFE 24-2123 e21

38 Processing of UK Trident missiles in the US, TNA DEFE 24-2123 e21

39 Processing of UK Trident missiles in the US, TNA DEFE 24-2123 e21

40 “the Duff/Mason criterion of aiming to be able to maintain an independent capability for at least one year” Trident: Processing D5 missiles in the US, TNA DEFE 24-2123 e6

41 “the critical factor so far as our dependence on the US is concerned is the repair of certain spares for the strategic weapon system, and that this is likely to be as true of D5 as it is of Polaris”. MISC7:Strategic Nuclear Independence, D Brennan, DS17, 13 November 1981, TNA DEFE 24-2123 e5. Also DEFE24-2123 e6

42 Government response to Scottish Affairs Committee Terminating Trident—Days or Decades

43 US lawmakers eye basing submarines at US port if expelled by Scots, Elaine Grossman, Global Security Newswire, 31 October, 2012

The Trident base at King's Bay Georgia is spread over a large area. However, it would still be difficult to find space for separate UK nuclear warhead and missile storage, because of the need for spacing between explosives facilities. The bunkers are surrounded by a clear area which varies between 700 and 1000 metres in width. The Explosives Handling Jetties are 2 kilometres from these bunkers.

The Department of Defence is considering how far to trim back their proposals for a new fleet of nuclear-armed submarines. If numbers are substantially reduced, they may decide to close their Atlantic facility and operate all the submarines from Bangor, Washington State, where the majority are currently based. Were this to happen, the only US option for Britain would be to base the Royal Navy's Trident fleet on the Northern fringes of the Pacific Ocean.



King's Bay (USA)



Ile Longue (France)

France

On 2 November 2010 two new defence agreements between the UK and France were announced. One of these is for a joint nuclear weapon's research establishment at Epure. The two countries will share hydrodynamic test facilities, but they will keep the data from their experiments separate. There have been calls for Britain to consider coordinating nuclear patrols with France, as a way to reduce the number of submarines required. These suggestions of closer collaboration follow the embarrassing collision between *Le Triomphant* and *HMS Vanguard* on the 3rd February 2009.

It might be possible to expand Anglo-French nuclear cooperation by asking Paris to host the British nuclear fleet. French submarines, together with their missiles and nuclear warheads are handled in a compact site at Ile Longue in Brittany. This base for the Force de Frappe lacks the separation distances between facilities which are found at British and American nuclear submarine sites.

British Vanguard class submarines are longer, wider, deeper and have a larger displacement than the Triomphant class. The Trident D5 missile is longer than its French equivalent, M51. French safety clearance for British submarines, missiles and warheads would require the transfer of classified American information, including on reactor design, which the US has so far withheld from Paris. The UK Government said, in its submission to the Scottish Affairs Committee, that "the appropriate facilities do not exist in France."⁴⁴

The UK and France would be in breach of the NPT if UK nuclear warheads were handled in French buildings. But, there is no space on the Ile Longue peninsula for the separate British facilities that would be required. The only way to accommodate Trident in France would be for the UK to build a new submarine base and nuclear armaments depot.

Taking Trident across the Channel would highlight one of the underlying reasons for Britain having nuclear weapons. At several key points in the history of the British nuclear weapons' programme an important factor was concern that if Britain gave up its nuclear arms then France would be the only nuclear-weapon state in Western Europe. This was considered by many in the British establishment to be intolerable. Although less frequently said, this remains a factor today. Moving Vanguard class submarines to Brittany would also mean that the British nuclear force was dependent on the support of both the American and the French Governments.

⁴⁴ The Referendum on Separation for Scotland: Terminating Trident—Days or Decades?: Government response to the Committee's Fourth Report of Session 2012-13, Scottish Affairs Committee, House of Commons, 8 January 2013

Support ship

The US Navy deployed depot ships to the Holy Loch in Scotland and Rota in Spain to support Polaris nuclear submarines. These vessels handled both missiles and warheads. In addition missiles and warheads were transported between the US bases and these forward locations by USNS Marshfield and USNS Victoria.

In the 1960s Britain contemplated deploying Polaris submarines to the Far East, supported by a similar depot ship.⁴⁵ In 1979 USNS Victoria became surplus to requirements following the withdrawal of Polaris from Rota. The MOD considered buying the vessel and converting it into a depot ship. Their plan was to base Victoria at Loch Striven with a complement of missiles and warheads. A significant motivation for this proposal was the Ministry's fear of industrial action at Coulport. After a brief review they decided not to purchase the vessel.

The MOD might contemplate acquiring a floating depot for Trident and then deploying it either in Britain or abroad. There is no direct precedent for this as the US Navy never built a depot or transport ship capable of handling the large Trident D5 missile.

Moving the base offshore might appear to circumvent restrictive safety regulations, however this would not be as easy as it might appear. Any plans would need the approval of US authorities, which might not be forthcoming because the risks of an accident on a floating facility are significantly higher than on shore. Mating Trident warheads and missiles is a problematic process and carrying it out on a ship may not be acceptable. The safety requirements for moving armed Trident missiles could probably not be met on a support vessel.

The Ministry of Defence (MOD) might think they could evade scrutiny from the Office of Nuclear Regulation (ONR) by using a depot ship. However ONR could not be completely excluded. Current practice would suggest that the berth of a support ship would be regarded as a nuclear site for the purposes of the REPPIR regulations, which are supervised by ONR. The Defence Nuclear Safety Regulator (DNSR) might not be as rigorous as an independent regulator, but it is hard to image them permitting the handling of Trident missiles and nuclear warheads on a depot ship, in a restricted space and subject to the elements. It would be impossible to build large contained spaces capable of preventing the simultaneous detonation of missiles and warheads, or to have a modern design which would reduce the risk of the dispersal of radioactive material. Moving Trident support offshore would be a return to a 1960s approach to nuclear and explosives safety.

45 Polaris 1964-66 TNA DEFE 13-350

Trident and Scottish independence

A deal to keep Trident?

If Scotland was independent, one conceivable outcome would be that the Scottish government would negotiate a deal with the remainder of the United Kingdom (rUK) to enable nuclear weapons to stay on the Clyde. It has been suggested that a concession on Trident could be linked to a financial deal or support for membership of the EU and NATO. However a deal would be far more problematic than is often assumed. Two issues are timescale and control of the Clyde Naval Base.

With regard to timing there are two options. One is that Trident and its replacement are allowed to stay for 50 years. This would require an agreement between the Scottish and rUK governments permitting nuclear weapons to operate from the Clyde throughout the life of the replacement for Trident, until 2067.

The second option is that Trident is only allowed to stay until the rUK government completes replacement facilities in England or Wales. The decision to acquire Trident was taken in 1980 and the first submarine was operational in December 1994. It took the MOD 14 years to modify the existing facilities at Faslane and Coulport for Trident. Building from scratch on a new site would take far longer. 20 years would be a minimum. This assumes that an alternative could be found, which is highly questionable. It would take the MOD some time to establish if any alternative site was viable. If Scotland went down the road of allowing Trident to stay until a replacement site was identified and new facilities built, then the system could remain on the Clyde indefinitely, because the search for an alternative location might be fruitless.

The idea that Trident could stay for one or two years, while negotiations take place, and then easily be relocated, is unrealistic. This is not an option. The practical alternatives are 20 years or 50 years, and the 20 year option may be an illusion.

In October 2012 the Scottish National Party (SNP) changed their policy towards membership of NATO, abandoning their previous opposition to membership of the alliance. It has been suggested that, if they formed the government of an independent Scotland, then the SNP would make a similar u-turn on Trident. However the debate on NATO showed the depth of grassroots opposition to Trident across the party. The SNP leadership made it clear that Scotland would only join the alliance on condition that nuclear weapons were removed. They also agreed, two weeks before the vote on NATO, that the constitution of an independent Scotland would include a specific ban on nuclear weapons. This has subsequently been clearly established as part of the SNP's proposals for a Scottish constitution.

On 25 January 2012 Scottish Green Party MSP Patrick Harvie asked First Minister Alex Salmond if he would promise not to do a deal that would mean Trident remaining in Scotland. Alex Salmond replied: "It is inconceivable that an independent nation of 5.25 million people would tolerate the continued presence of weapons of mass destruction on its soil."⁴⁶ On 28 January 2013 the Deputy First Minister, Nicola Sturgeon, was asked by the Commons Foreign Affairs committee about the possibility of the UK government leasing Faslane. She replied "We would not be in a position of accepting that kind of arrangement. We have a principled opposition to Trident nuclear weapons."⁴⁷

Opposition to nuclear weapons is not the exclusive preserve of the SNP. There is a long history of support for nuclear disarmament in Scotland. The first Polaris submarines to arrive in Britain were American vessels sent to the Holy Loch in 1961. The imposition of these Weapons of Mass Destruction on the Clyde sparked nationwide opposition. Key institutions in civic Scotland, such as the churches and trade unions, have maintained solid resistance to Polaris and Trident over recent decades.

The different perspectives North and South of the border can be seen by comparing debates in London and Edinburgh. In March 2007 the House of Commons supported the plan to replace Trident, with 406 in favour and 161 against. However, the majority of MPs representing Scottish constituencies opposed the upgrade. In June 2007 the Scottish

46 Official Record, Scottish Parliament 25 January 2012

47 Press Association 29 January 2013.

Parliament called on the UK government not to go ahead with this plan. Out of 129 MPs, only the 16 Conservatives supported the proposal. When nuclear weapons have been discussed in the Scottish Parliament almost the only argument made in favour of Trident has been that it sustains jobs, although more posts would be created if the same money was used for other purposes. The tone in these Scottish debates has ranged from grudging acceptance to angry resistance.

The long-term operation of rUK's entire nuclear fleet from a foreign base would be hard to sustain from an rUK perspective. Trident is already dependent on American support. The rUK government would not want its nuclear capability to also rely indefinitely on the goodwill of Holyrood.

Philip Hammond has made it clear that if Trident was operating from an independent Scotland then rUK would want complete control over Faslane and Coulport. It has been suggested that a corner of the West coast of Scotland could become like the American base at Guantanamo Bay in Cuba, or the Russian enclave of Kaliningrad on the Baltic.

The rUK would want to control activities beyond the perimeters of Faslane and Coulport. In order to sustain operations there are regular movements by road between the two sites. A military enclave would have to link Faslane and Coulport. This would isolate the Rosneath peninsular from the rest of mainland Scotland. Residents of the peninsular would have to travel through this rUK enclave to reach Helensburgh.

Trident submarines would have to sail through Scottish waters when leaving from and returning to the Clyde Naval Base. There are currently restrictions on limited areas of water around the base. More extensive rights of passage would be sought if the area became a rUK enclave.

The SNP are proposing that Faslane would become the base for a Scottish Navy if Scotland were independent. Retaining the site as a sovereign rUK base would not be consistent with this.

In addition to the practical problems, establishing a military enclave in part of Scotland would be highly controversial. It is unlikely that any Scottish government would be able to secure public support for such a proposal.

Timescale for Trident removal

In June 2012 Scottish CND published a report which argued that the Trident nuclear weapon system could be put beyond use within 7 days and that all nuclear warheads could be removed from Scotland within 2 years.⁴⁸ This timescale was described as reasonable, in practical terms, by leading American nuclear-weapons' experts Dr Bruce Blair and Professor Richard Garwin.

The Scottish Affairs Committee of the House of Commons said:

“Nuclear weapons in Scotland could be disarmed within days and removed within months. We accept the analysis of Scottish CND that, with the cooperation of the Navy and the UK Government, this process would be both speedy and safe”.⁴⁹

The Scottish Government's response was:

"We are firmly committed to the earliest possible withdrawal of Trident from Scotland The suggested timetable is a welcome indication of how quickly Trident could be removed once Scotland has the powers to decide its own defence and security policy".⁵⁰

The removal of Trident might be even more rapid. If the appearance of an independent anti-nuclear Scotland was imminent, then the London government might well remove all nuclear weapons from Scotland prior to independence. Washington might insist that the American-built missiles and the nuclear warheads, which contain American components, were removed from Faslane and Coulport, and not left on the territory of an actively anti-nuclear sovereign state.

48 Disarming Trident: A practical guide to de-activating and dismantling the Scottish-based Trident nuclear weapon system, Scottish CND and Scotland's for Peace, June 2012

49 The Referendum on Separation for Scotland: Terminating Trident – Days or Decades, Scottish Affairs Committee, House of Commons, Fourth Report of Session 2012-13, 25 October 2012

50 Sunday Herald 17 June 2012

Who would pay?

Philip Hammond said that Scotland would be forced to pay towards the costs of relocating Trident. Admiral West adopted a similar line saying, "If this was forced on us by separation, then a lot of the costs for clean-up, for want of a better word, should be carried by Scotland."⁵¹ Lord Robertson added: "If the SNP dogmatically demand the withdrawal of Trident it will have to pay multibillion-pound compensation for it to be relocated".⁵²

But these are idle threats. Following the collapse of the Soviet Union, the Ukraine, Belarus and Kazakhstan found themselves as independent countries with large numbers of nuclear weapons. It would have been inconceivable for Russia to demand that the former Soviet states paid for the construction of new missile silos and a new submarine base. The Black Sea Fleet was divided between Russia and the Ukraine. Russia paid the Ukraine to retain more than half of the ships. Part of the agreement was that all nuclear weapons would be removed from the fleet.⁵³ The Russian Navy withdrew its nuclear-armed submarines from their base at Balaclava, scene of the Thin Red Line in the Crimean war. This massive underground complex is now a tourist attraction.⁵⁴

Response from rUK and other nations

Some commentators suggest the rUK might force an independent Scotland to continue to host nuclear weapons. But this assumes that there is solid support for Trident in the London establishment. In the past there have often been senior figures in Whitehall, particularly the Treasury, who have questioned the cost of remaining a nuclear power.

This is a significant issue today. The short term capital costs of replacing Trident are at least £20 billion and the long term costs are in the region of £100 billion. At a time of economic recession it is particularly difficult for the Government to justify this. Since the end of the Cold War the rationale for British nuclear weapons has become much weaker. There is a reluctance to express the gut feeling that Britain needs nuclear weapons to be great, because this undermines the idea that the UK is a responsible power concerned about proliferation. The coalition government is split. The Liberal Democrats have rejected the Moscow criterion, which provides the rationale for Trident, and they are opposed to a like-for-like replacement for the existing system.

There has been criticism of the plans to replace Trident from former Defence Ministers. Lord Browne (Labour) and Lord King (Conservative). Both have questioned the need for Continuous At Sea Deterrence, which lies at the heart of current nuclear policy.⁵⁵

Another former Tory Defence Minister, Michael Portillo, gave a damning verdict on Britain's nuclear programme. In response to the question "Should Trident be renewed?", he replied "No, I think it is all nonsense". Then when asked "Should we have any kind of nuclear deterrent?" Portillo said, "No, it's completely past its sell by date. It's neither independent, because we couldn't possibly use it without the Americans, neither is it any sort of deterrent, because now largely we are facing enemies like the Taliban and Al Qaeda, who cannot be deterred by nuclear weapons. It's a tremendous waste of money. It's done entirely for reasons of national prestige and at the margins it is proliferation".⁵⁶

There is a pro-Trident lobby within the UK defence establishment, but it is not all powerful. Trident is competing with other defence programmes – not just with spending on the Army and Air Force, but also on surface ships in the Navy. Replacing Trident would place a huge strain on the Defence Procurement budget over the next 20 years. The MOD are planning to spend £35.8 billion of their equipment budget for 2012-22 on their submarine and nuclear weapons' programmes. These are due to account for 35% of MOD capital expenditure in the early 2020s. It has been suggested that perhaps Trident should be paid for by central government and not from the Defence Budget. Danny Alexander, Chief Secretary for the Treasury, has rejected this. He said, "I just think the idea that somehow, out of thin air, we can carve a multibillion pocket to pay for this, that is not financially realistic".⁵⁷

51 Admiral West speaking on Radio 4, quoted in the Daily Record, 30 December 2011

52 Robertson slams SNP for 'reckless' defence plan. Herald, 21 January 2012

53 <http://www.princeton.edu/research/cases/ukraine.pdf>

54 <http://wikimapia.org/6408751/Underground-Submarine-base-Nuclear-warheads-storage-Now-museum>

55 House of Lords, 24 January 2013.

56 BBC This Week 1/11/2012 http://www.bbc.co.uk/iplayer/episode/b01nqn6j/This_Week_01_11_2012/

57 Guardian 22 January 2013

Renewed questioning of Trident across the UK will have an impact on the ease with which an independent Scotland could fulfill its ambition of removing nuclear weapons. At the same time, the Scottish question will affect the Trident replacement debate.

If Scotland votes YES then this will sound the death knell for Britain's nuclear weapons. Even if the referendum does not result in Scottish independence, the constitutional issue will continue to have a bearing on long-term plans for British nuclear weapons. The current proposal, to build a new submarine, missile and nuclear warhead that would be based in Scotland until 2067, is scarcely credible.

It is wrong to assume that British nuclear disarmament, initiated by Scottish independence, would be met with cries of anguish from around the world. Successive US governments have supported the UK nuclear programme, but their enthusiasm for doing so should not be exaggerated. There is no example of a British Prime Minister going to an American President and asking to get out of the nuclear business. The nearest case was when Harold Wilson was first elected Prime Minister. The US State Department thought Wilson was going to abandon nuclear weapons, so they prepared a briefing for President Johnson setting out how America could help him to carry out his disarmament policy. When they met, Wilson told Johnston that he wasn't in favour of disarmament, so the State department's briefing notes were superfluous.

In 1981 the British Embassy in Washington told the MOD that although Jimmy Carter had signed off the initial Trident deal, he had not been enthusiastic –

“the 1980 agreement was concluded only after serious doubts on the part of President Carter himself had, with considerable difficulty, been overcome”.⁵⁸

They added that although President Reagan, who was in post at the time, was fully supportive –

“It would be unwise to assume that future US Administrations will necessarily take quite so positive an attitude.”⁵⁹

During the Cold War US governments were more interested in Britain making a substantial contribution to conventional forces in Europe than in our nuclear capability. The possibility that the UK would scale back its army, navy and air force to pay for nuclear weapons was a recurring concern in Washington. In recent years the White House has been eager to obtain British support in Iraq and Afghanistan. If faced with a choice, the US is likely to prefer that Britain pays to have troops on the ground rather than Trident.

With regard to other nations, some might take the lead from the US or the UK. Others are likely to warmly welcome the new step towards disarmament, whatever the advice from Washington and London.⁶⁰ In the eyes of many countries, it would not look good if the rUK government sought to coerce, bully or bribe an unwilling young Scotland to host its entire nuclear arsenal.

The Scottish referendum takes place in the context of growing internal questioning of whether Britain can afford to have nuclear weapons and international interest in promoting nuclear disarmament and non-proliferation. A Scotland which votes for independence and then sustains a clear policy of banning these Weapons of Mass Destruction will be able to set an example to the world. If this leads to there being no nuclear weapons on the British islands, then it could help to break the logjam and to encourage global nuclear disarmament.

58 Processing of UK Trident missiles in the US, British Embassy Washington, MJE Fretwell, 3 December 1981, TNA DEFE 24-2123 e21

59 Processing of UK Trident missiles in the US, TNA DEFE 24-2123 e21

60 On 4-5 March 2013 delegates from 132 nations gathered in Oslo to discuss the Humanitarian Impact of Nuclear Weapons. This was the start of a new initiative towards disarmament. It was successful despite being boycotted by the US, Russia, UK, France and China. A follow-up meeting will be held in Mexico.

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77 Southpark Avenue, Glasgow, G12 8LE
tel: 0141 537 1529 email: scnd@banthebomb.org
web: banthebomb.org

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