

# Trident: Nowhere to Go

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# Trident: Nowhere to Go

By John Ainslie

## Summary

Officials in the Ministry of Defence (MOD) have told the Financial Times that they are looking at the consequences of Scottish independence for the Trident programme. Key questions are whether the nuclear fleet could be moved, and if so where? Defence Secretary Philip Hammond said that relocating Trident would cost billions and take many years<sup>1</sup>. Admiral Lord West added that moving the nuclear armaments depot from Coulport would be a “huge, huge complex operation”<sup>2</sup>.

Almost 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 would be a further option.

This report examines the feasibility of these alternatives. There are major obstacles to each one of them. 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.

There were three English sites on the Polaris shortlist. One was Portland, near Weymouth. Part of the area which would be required for Trident has been transformed into the sailing venue for the 2012 Olympics. David Cameron is keen to stress the legacy that the Olympics will leave, but even he would find it difficult to argue that this should mean parking nuclear-armed submarines at Weymouth.

A second alternative was Devonport. The MOD considered transforming the Cornish shore, opposite the dockyard, into a nuclear weapons’ store. To accommodate Trident they would have to buy Antony House and its grounds from the National Trust. In addition to the great difficulty of acquiring this site, the nuclear depot would be too close to a residential estate. The Office of Nuclear Regulation would almost certainly try to block any proposal to build a nuclear missile store next to a city with a population of a quarter of a million.

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 if not impossible. The warhead depot would be North of Falmouth. Two villages would be so close to the depot that they would have to be abandoned. Both are significant centres for watersports, especially Mylor in Churchtown where Ben Ainslie learned to sail. 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. Jobs that might arise from introducing Trident would be offset by a major decline in the watersports industry and tourism.

In 1963 officials proposed combining a submarine base at Devonport with an

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1 BBC Radio 4 lunchtime news 19 January 2012

2 BBC Radio 4 lunchtime news 19 January 2012

armaments depot at Falmouth. But there would still be huge problems at the two sites. This plan would still mean introducing nuclear missiles into Plymouth and taking over a large peninsula on the Fal estuary. A nuclear missile depot would ruin the tourism and watersports industries in Falmouth and bring few long-term jobs.

An existing nuclear site that could be considered is Barrow in Furness, where the submarines are built. This might be suitable if the Navy only deploy Trident when there is a full moon and a high tide. Otherwise it is a non-starter. Walney Channel is too shallow for a submarine base. The Barrow options falls at the first hurdle and 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 three 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. In 1979 Sir Frank Cooper, Permanent Under Secretary at the MOD, went further. He said it was most unlikely that they could build a replacement for Coulport on any greenfield site.<sup>3</sup> 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, rather than use the US Navy ones. The force would also be transparently even less independent than it already was.

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 far too small to allow room for the separate British facilities that would be required. As with the American option, Britain would have to find a greenfield site somewhere else in Brittany to turn into a nuclear base. The political problems would almost certainly be insurmountable.

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 with Trident 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.

Scotland shouldn't be expected to keep Trident just because no-one else will have it. Admiral Lord West suggested that independence for Scotland would result in unilateral nuclear disarmament.<sup>4</sup> 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 would mean there were no nuclear weapons in Britain. This could give a new push to global efforts towards a nuclear-weapons free world. Whatever the result of the 2014 referendum, there is now a huge question mark over the future of the British nuclear weapons' programme.

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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 history of the British nuclear weapons programme.

4 "Would this effectively lead us into unilateral disarmament because the costs of replicating the ship lift, the explosive handling jetty, the big storage facility at Coulport, would be billions and we would have to think of where that was put?" Admiral West speaking on Radio 4, quoted in the Daily Record, 30 December 2011.

## Options in England and Wales

### General Points

An account of how the MOD assessed where to base the Polaris force is given by Malcolm Chalmers and William Walker in *Uncharted Waters: the UK, nuclear weapons and the Scottish question*.<sup>5</sup>

There are two components of any nuclear-armed submarine base. One is a site to berth and support the submarines. The second is a depot to store and handle nuclear warheads and missiles. There are particular problems with finding a suitable site for the latter.

### *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.<sup>6</sup> The Polaris depot at Coulport, built on this basis, occupied an area of 128 hectares.<sup>7</sup>

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.”<sup>8</sup>

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.”<sup>9</sup> 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”.<sup>10</sup> The MOD drew up a plan to expand Coulport to 1067 hectares, eight times its original size.<sup>11</sup> Under this proposal they would have been maintaining as well as storing missiles, as had been the case with Polaris.

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

5 *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>

6 *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.

7 [http://hansard.millbanksystems.com/written\\_answers/1981/jul/14/trident-coulport-base](http://hansard.millbanksystems.com/written_answers/1981/jul/14/trident-coulport-base)

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

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

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

11 [http://hansard.millbanksystems.com/written\\_answers/1981/jul/14/trident-coulport-base](http://hansard.millbanksystems.com/written_answers/1981/jul/14/trident-coulport-base)

with Coulport became far greater. As a result the government decided to transfer the missile maintenance work to the United States.<sup>12</sup> 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 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 magazines 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 Explosives Handling Jetty. 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. The British government are unlikely to be any more open about how they would calculate the safety zones for a new Trident facility.

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.<sup>13</sup> Consequently at any site where there is a fully-armed submarine there is the risk, not

12 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.

13 A radiological probabilistic risk assessment of the Faslane shiplift for Vanguard class submarines



just of the detonation 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.<sup>14</sup>

When the reductions announced in the Strategic Defence and Security Review are implemented, each submarine will carry 8 missiles, ie around 560 tonnes of TNT equivalent in rocket fuel. The risk of a missile explosion is highest at the Explosives Handling Jetty. The nuclear warheads are located in a circle around the third stage of the D5 missile. This third stage could detonate in the event of an impact. This fundamental weakness in the D5 design is well known. Current British practice is to load and unload warheads from the missiles while they are in the submarine, rather than to unload armed missiles and then separate the warheads on shore. However the removal of armed missiles is not ruled out.



Coulport - Ready Issue Magazines



Coulport - Reentry Body Magazines

In reviewing their long-term plans for nuclear weapons, the MOD assume that safety regulations may be tighter in future than they are today. So the safety distances which were applied in 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 the two at Coulport. However these reductions are unlikely to have a significant effect on the overall size of the area required for a depot, and would be offset by increasing spacing distances.

The Coulport depot today takes up an area of 364 hectares. It has 32 kilometres of internal roads and 30 kilometres of alarmed fence.<sup>15</sup> 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 an area 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 separation distances from inhabited areas would be greater.

#### Submarine base

Safety is a 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-

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with Strategic Weapon System embarked, AWE Aldermaston, November 2000. Obtained by Scottish CND under the Freedom of Information Act.

14 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.

15 [http://www.mod.uk/NR/rdonlyres/B1415470-BC8B-47E1-90C0-E206AF6748A0/0/tt133\\_dec07.pdf](http://www.mod.uk/NR/rdonlyres/B1415470-BC8B-47E1-90C0-E206AF6748A0/0/tt133_dec07.pdf)

explosive rocket fuel, nuclear warheads, torpedoes and a nuclear power plant. The MOD's risk assessments acknowledge the possibility that a missile accident could result in a release of radioactive material from the reactor.

### *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.<sup>16</sup>

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 it 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.<sup>17</sup> Michael Quinlan said “A new ‘greenfield’ site in the UK should I suggest, be assumed as a last (but not impossible) recourse.”<sup>18</sup> 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”.<sup>19</sup> He added that the MOD should not delude themselves into thinking that a greenfield site was acceptable.<sup>20</sup>

## **Devonport**

At first glance, the most obvious alternative for Trident would be Devonport. Refits of Trident submarines are carried out in Devonport yard and conventionally-armed nuclear-powered submarines are based here, although the last of them are due to sail to .

Moving Trident to Devonport would mean finding space for the submarines within the existing site and finding somewhere to build a nuclear armaments depot. In 1963 the proposal was to build the depot on the Cornish side of the Tamar at Wilcove.<sup>21</sup> There was concern about the response from the National Trust, who own Antony House. 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. It would only be viable if the National Trust sold the building and its extensive gardens to the MOD. Antony House was the setting for the Tim Burton's recent film *Alice in Wonderland* in which Johnny Depp played the

16 Uncharted Waters Chalmers and Walker

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

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

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

20 “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

21 Working Party Report; Uncharted Waters Chalmers and Walker.





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

Mad Hatter.<sup>22</sup>

A second problem that was foreseen in the 1960s 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.



Antony House

HMS Raleigh, as this would be immediately next to the nuclear depot. Even the old 1960s criteria of maintaining a gap of 1.34 kilometres from any residential housing could not be met.

A damning factor is that Devonport is in the city of Plymouth which has a population of 250,000. 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.

## 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.<sup>23</sup> The photo superimposes images of Faslane and Coulport on these two sites to indicate what a nuclear base at Falmouth would look like.

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

<sup>22</sup> <http://www.nationaltrust.org.uk/antony/>

<sup>23</sup> Working Party Report; Uncharted Waters Chalmers and Walker.



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

Handling Jetty and submarine berths. There is deep channel which zig-zags across the estuary.<sup>24</sup> 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 for nuclear submarines.

The site of the Explosives Handling Jetty (EHJ) would be 800 metres South East of Mylor Churchtown. The missile or 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 Restrouquet 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 on the road 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.

At Coulport there is a Restricted Area of water 700 metres from the shore in Loch Long. There is a further Protected Area within 250 metres of the shore. Pleasure craft which sail close to the nuclear depot are intercepted by MOD Police patrol boats and warned to keep clear. There are no yachts or dinghies moored off Coulport.



© Phil Beard via Flickr

Mylor Churchtown



© Joanna Paterson via Flickr

Explosives Handling Jetty (Coulport)

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 alternative places for their vessels. There is a five year waiting list for moorings around Falmouth. 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. A large number of moorings at St Just in Roseland might also have to be abandoned due to their proximity to the shiplift and jetties.

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 depot and 1.5 kilometres from the missile and nuclear warhead buildings.

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 extend to 2 kilometres from the nuclear facilities in the depot and would include a large part of Falmouth.

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 tourism blight of a nuclear weapons' base.

The 1963 proposal for the submarine base was to build it 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 effort to protect the British coastline, particularly in Cornwall. 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 major factor in their elimination of the Falmouth option.

The MOD thought that developing the armaments depot would be very expensive. One factor was the difficulty in adapting the terrain. Another was the considerable cost and complication of land purchase.

They were concerned that both the National Trust and the Duchy of Cornwall might block their proposal. In addition to its land holdings, the Duchy owns all the foreshore in the county. Prince Charles might find himself torn between his affinity with the Royal Navy and his promotion of produce from the pristine environment of Cornwall.

## Devonport and Falmouth

Faced with the difficulty of finding a suitable site for a nuclear ammunition depot in Devonport, the 1963 review considered the possibility of combining Devonport and Falmouth. Devonport could house the submarine base and Falmouth the nuclear weapon store. The MOD rejected this arrangement because it would "stretch to an unacceptable degree the requirement for proximity of the operating base and the RNAD".<sup>25</sup> They insisted that the ammunition depot should be within one hour's sailing of the submarine base. Falmouth is 70 kilometres West of Devonport.

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. There is a strong argument that Britain should, at the very least, 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.

This two-base option 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: "If the [nuclear deterrent] had to be relocated, the only

viable base is Devonport, with a new RN Armament Depot probably at Falmouth.”<sup>26</sup>

The Devonport-Falmouth option would get round the problem of acquiring land at St Just in Roseland or Wilcove from the National Trust. However the problems of proximity to urban areas at both sites would remain. Introducing submarines armed with missile and nuclear warheads would significantly increase the risks of an explosive/nuclear accident in Plymouth. The armaments depot would still be too close to the town of Falmouth and would have a dramatic effect on the surrounding area.

Separating the facilities would change the proposal that would be presented to Falmouth. If only the warheads and missiles are based on the estuary then the area would be faced with the limitations and blight of hosting nuclear weapons, together with the loss of a large area of land, without the jobs associated with a submarine base. There would be 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 – as armed police telling visitors that they can't go along their favour walk or sail too close to the shore.

### Portland (Weymouth)

Portland Naval base was on the shortlist for Polaris.<sup>27</sup> It was ruled out because of the lack of a suitable site for a nuclear armaments depot in the vicinity. 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. This new complex will host all the sailing events in the 2012 Olympics.



Olympic sailing venue Portland (Weymouth)



Faslane Trident base



Lulworth Cove

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 existing 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 Polaris review did not identify any suitable shore site for a nuclear armaments depot in this area. One that might be considered is Lulworth Ranges, 15 kilometres from Portland. This is an area of land owned by the MOD next to the renowned beauty spot of Lulworth Cove.

This option is likely to be rejected, not just by those who would be upset by the idea of

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

27 Working Party Report; Uncharted Waters Chalmers and Walker.





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



Area required for a nuclear armaments depot at Lulworth Ranges

nuclear weapons next to one of the best beaches in England, but also by the Army, who want to retain the training area as a tank range.

## Milford Haven



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Milford Haven refinery

The one Welsh site that made it onto 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 an 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 new oil terminal was closed.

Today Milford Haven has two terminals which offload Liquefied Natural Gas (LNG) from



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

tankers. Between them these terminals handle 30% of the UK's gas supply. In addition there are two oil refineries and a large tank farm which can store oil and gas, which handle 25% of Britain's petrol and diesel.

The proposed submarine base would be next to one of the LNG terminals and the tank farm and submarines would pass close to the main oil and gas terminals to approach the base. The petrochemical facilities would also be vulnerable to an explosion at the nuclear missile depot. It would not be possible 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 Milford Haven is not a viable option.

## 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.

However, Barrow did not make it onto the 1963 shortlist because is not a suitable location for an operational submarine base. Walney Channel is too shallow for nuclear submarines. 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.



HMS Repulse aground in Walney Channel 1967

This would involve towing newly-built vessels between the two dockyards. The RAND report provides a detailed explanation of the tidal problems of Walney Channel. There are a limited number of hours in each month when the tide is high enough for a nuclear submarine to transit 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 when the tide is sufficiently high.<sup>28</sup>

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 in 11 November 1967.

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

To the West of Walney Island there is deeper water, but this side of the island 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.

## 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 does from time to time load and unload unarmed Trident missiles onto and from 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. Basing our Trident fleet overseas, or even seriously discussing this option, raises questions about the extent to which another country might veto the deployment or use of British nuclear forces.

The third factor is the public response in the host country. Accommodating the nuclear weapons of a foreign power is always controversial. Obtaining consent would prove even more difficult than in the UK.

### United States

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 instead. One consequence of this change was that the costs of Trident would far exceed the initial budget. So the MOD studied a number of ways of cutting costs. One big ticket 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.”<sup>29</sup>

Officials felt 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.”<sup>30</sup>

The British Embassy in Washington gave their view on 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)”.<sup>31</sup>

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. Congress might accept the proposal but negotiating control over warheads and safety issues could be difficult.

The Embassy 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.”<sup>32</sup>

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.”<sup>33</sup>

These files show that the Royal Navy only maintains sufficient spares to sustain the Trident system for 12 months.<sup>34</sup> There are a number of vital missile components, in the guidance and

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

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

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

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

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

34 “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.

flight control systems, which are replaced on a regular basis.<sup>35</sup> These can be accessed from inside the submarine. The UK only holds a 12-month store of these parts. Whether based in Britain or the United States, the UK cannot continue to operate its nuclear weapons for more than one year if Washington withdraws its support. The Government were concerned that the proposed arrangement 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.



Kings Bay Naval Submarine Base, Georgia, USA

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, because of the NPT. Moving to an American base would raise public awareness, in Britain, America and around the world, of how the British force is dependent on US support.

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. This is because of the substantial spacing between explosives handling 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 are currently 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 nuclear-armed submarines from Bangor, Washington State, where the majority are currently based. Were this to happen, then the only American option for Britain would be to base the Royal Navy Trident fleet on the Northern fringes of the Pacific Ocean.

## 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 the hydrodynamic test facilities, but they will keep separate the data

35 “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.

from their experiments. There have been calls for Britain to consider coordinating nuclear patrols with France, as a way to reduce the number of submarines that would be required in future. 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



Ile Longue Strategic Submarine Base,  
Brest, France

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 and France would be in clear breach of the NPT if UK nuclear warheads were handled in French

buildings. But, there would be 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 nuclear submarine base and nuclear armaments depot.

Taking Trident across the Channel would also 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 become the only nuclear-weapons state in Western Europe. This was considered by many in the British establishment to be intolerable. Although less frequently said, this remains an factor today.

Moving Vanguard class submarines to Brittany would mean that the British nuclear force was dependent on the support of both the American and the French Governments.

## 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.<sup>36</sup> In 1979 USNS *Victoria* became surplus to requirement 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 be a way 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) may not be able to adopt the same approach as an independent regulator, nevertheless it is hard to imagine that they would endorse the handling of Trident missiles and nuclear warheads in the restricted space available on a depot ship, 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.

### Trident and Scottish independence

If Scotland was independent and insisted on the removal of nuclear weapons, then what would happen ?

Philip Hammond said that Scotland would be forced to pay towards the costs of relocating Trident.<sup>37</sup> 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.”<sup>38</sup> 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”.<sup>39</sup>

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 is ridiculous to suggest that these three countries should each have paid Russia to build new nuclear missile silos.

The Black Sea Fleet was divided between Russia and the Ukraine. Russia paid the Ukraine to retain more than half of the ships.<sup>40</sup> Part of the agreement was that all nuclear weapons would be removed from the fleet. 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.<sup>41</sup>

The second reason why Hammond’s threats are hollow is that relocation is not a serious option. The MOD are beginning to realise that if an independent Scotland holds its ground on Trident, then Britain would have to abandon its nuclear weapons programme. Just one week after the Defence Minister said Scotland would bear the costs of a new base, MOD officials were presenting a very different line. They explained that Scottish independence would be the “nightmare scenario” for Trident and that London would pay any price to keep Faslane and Coulport.<sup>42</sup>

37 Philip Hammond speaking on Radio 4, 18 January 2012

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

39 Robertson slams SNP for ‘reckless’ defence plan. Herald, 21 January 2012

40 <http://wvs.princeton.edu/research/cases/ukraine.pdf>

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

42 <http://www.telegraph.co.uk/news/uknews/defence/9043092/Nuclear-subs-will-stay-in-Scot->

If the appearance of an independent anti-nuclear Scotland was imminent, then the London government would remove all nuclear weapons from Scotland prior to independence. Washington would insist that the American-built missiles and the nuclear warheads, which contain American components, were removed from Faslane and Coulport.

Warhead storage and processing facilities at Burghfield can only handle a limited number of warheads. When Chevaline was withdrawn from service many of the warheads were taken from Coulport to RAF Honington rather than Burghfield. They were stored there until they were due for dismantling. Faced with an independent anti-nuclear Scotland the MOD would move the existing stockpile of Trident warheads to Honington for temporary storage. Trident missiles would be returned to Kings Bay in America.

Some commentators suggest the UK might force an independent Scotland to continue to host nuclear weapons. However this assumes that there is solid support for Trident in the London establishment. Historically there has always been an element of questioning, within Whitehall, of Britain retaining nuclear weapons, particularly from the Treasury. This is likely to be a significant force today with an economic crisis and expensive plans for Trident replacement. Since the end of the Cold War the rationale for British nuclear weapons has become significantly weaker. There is a reluctance to express the gut feeling that Britain needs nuclear weapons to be great, because this is contrary to our image as a responsible power concerned about proliferation.

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.

It is wrong to assume that the US government's approach to Scottish independence will be based the issue of nuclear weapons. 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”.<sup>43</sup>

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.”<sup>44</sup>

Today the Obama administration's approach to nuclear weapons is dominated by other concerns. Support for the British programme may be a peripheral issue.

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land-Royal-Navy-chiefs-decide.html

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

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

In the past the US-UK nuclear relationship has been kept firmly under the control of a very small number of individuals who are committed to supporting the British programme. The State Department in Washington is deliberately kept on the margins. Faced with the complex political issue of Scottish independence this may change.

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 on nuclear weapons in Westminster and Holyrood. In London a Scottish Labour MP was booed when she suggested that it was immoral to deploy Trident. When nuclear weapons were discussed in the Edinburgh parliament, in 2006 and 2007, almost the only argument made in favour of Trident was that it created jobs. The tone of the response in the Scottish debates ranged from grudging acceptance to angry resistance.

On 25 January Scottish Green Party MSP Patrick Harvie asked the First Minister 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.”<sup>45</sup>

Philip Hammond’s suggestion, that he would force an independent Scotland to pay for an expensive new nuclear base in some, as yet unidentified, corner of England’s green and pleasant land, shows a serious failure to understand the place of nuclear weapons in Scotland’s recent political history.







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