

What is the current status of Trident replacement in the UK ?

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Coordinator Scottish CND

Presentation for NFLA (Scotland) 26 February 2010

Trident replacement in the US



**President Obama's
budget for FY2011**

New submarines

New nuclear
warhead facilities

Ohio submarine replacement



Discussed by the Seapower Sub-Committee
House of Representatives
20 January 2010

Ohio submarine replacement



12 submarines

16 ? Missiles on each

First new sub 2027

**In service until 2080
(i.e. in 70 years time)**

Ohio submarine replacement



2006 estimate

\$3.4 bn per submarine

2010 estimate

\$6 -7 bn per submarine

Ohio submarine replacement



R&D		\$15 bn
Sub 1		\$10 bn
Subs 2-12	\$5 bn x 11	\$55 bn
Total		\$80 bn

Estimate of UK sub costs



Dec 2006 estimate
£11-14 bn

Estimate from US figures
£24.7 bn (\$40 bn)

R&D		\$15 bn
Sub 1		\$10 bn
Subs 2-4	\$5 bn x 3	\$15 bn
Total		\$40 bn

Ohio submarine replacement



“We have a looming need to replace the Ohio Class strategic missile submarine, but doing so may cripple the Navy shipbuilding budget.”

Fund from outside the Navy shipbuilding budget

Rep Gene Taylor

Ohio submarine replacement



Trident missile until 2040

**New missile 2040 +
Larger diameter than
Trident**

**Loren Thompson
(Lexington Institute)**

Common US/UK development

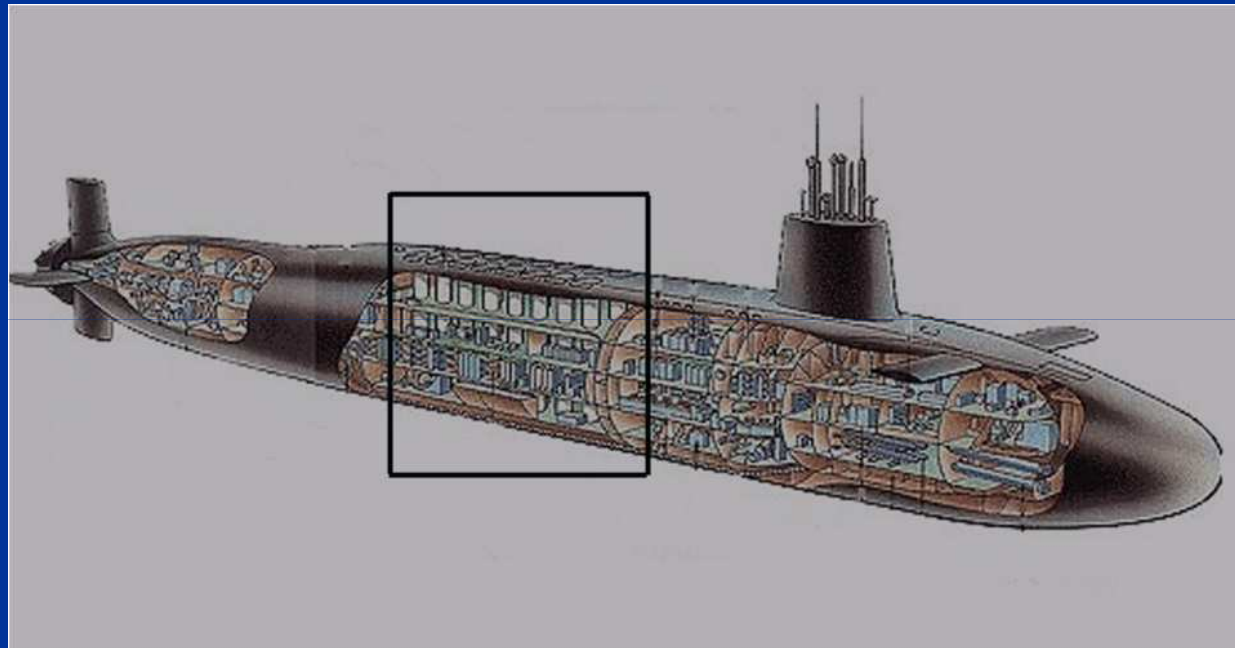
Projected In Service Dates

	2006 plan	2010 plan
US	2029	2027
UK	2024	2024 ?

UK programme might be pushed back to match US programme.

Common US/UK development

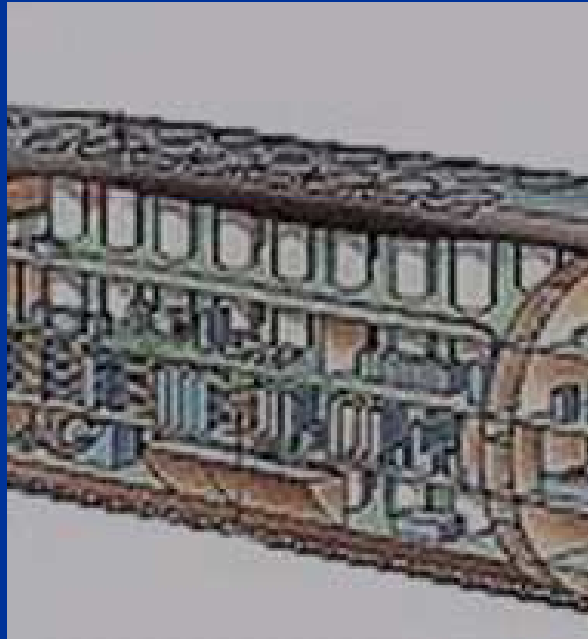
Common Missile Compartment



For both US & UK subs.
Each module will contain 4 missile tubes

Common US/UK development

Common Missile Compartment



Potential for larger diameter for future missile, cruise missiles or special forces.

Tests needed on firing Trident from large diameter tube – initially paid for by the UK

Common US/UK development

US assistance for Barrow



Electric Boat were called in to sort out Barrow's problems with Astute.

Electric Boat involved from the start in the UK Trident replacement.

UK concept phase

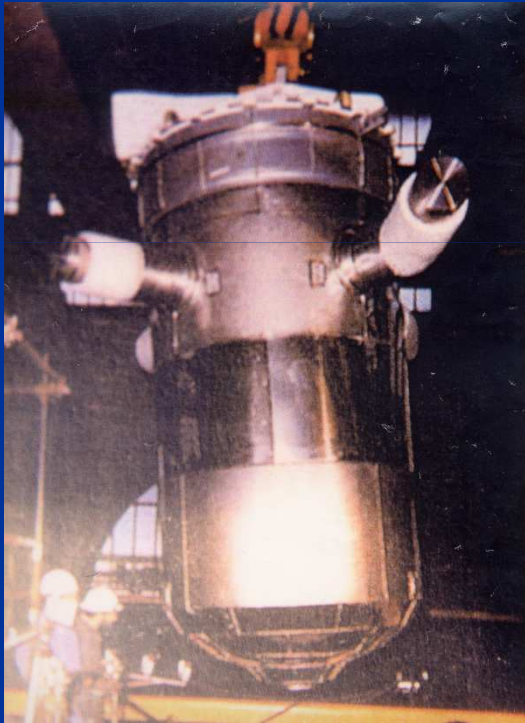
Expenditure on new submarine 2007 - 2009

	Budget	Actual
Platform	£131m	
Reactor	£179m	
Total	£290m	£380m

£380m of “pondering money”
Hugh Muir, Guardian

UK concept phase

Reactor Options



(1) PWR2

Used on Vanguard & Astute

(2) New PWR3

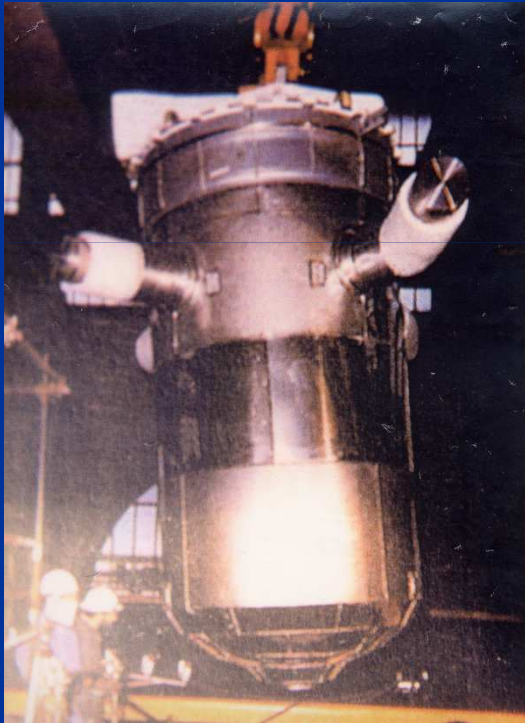
MoD claims it will be quieter,
safer & cheaper to run.

But it requires major R&D.

US assistance in reactor R&D

UK concept phase

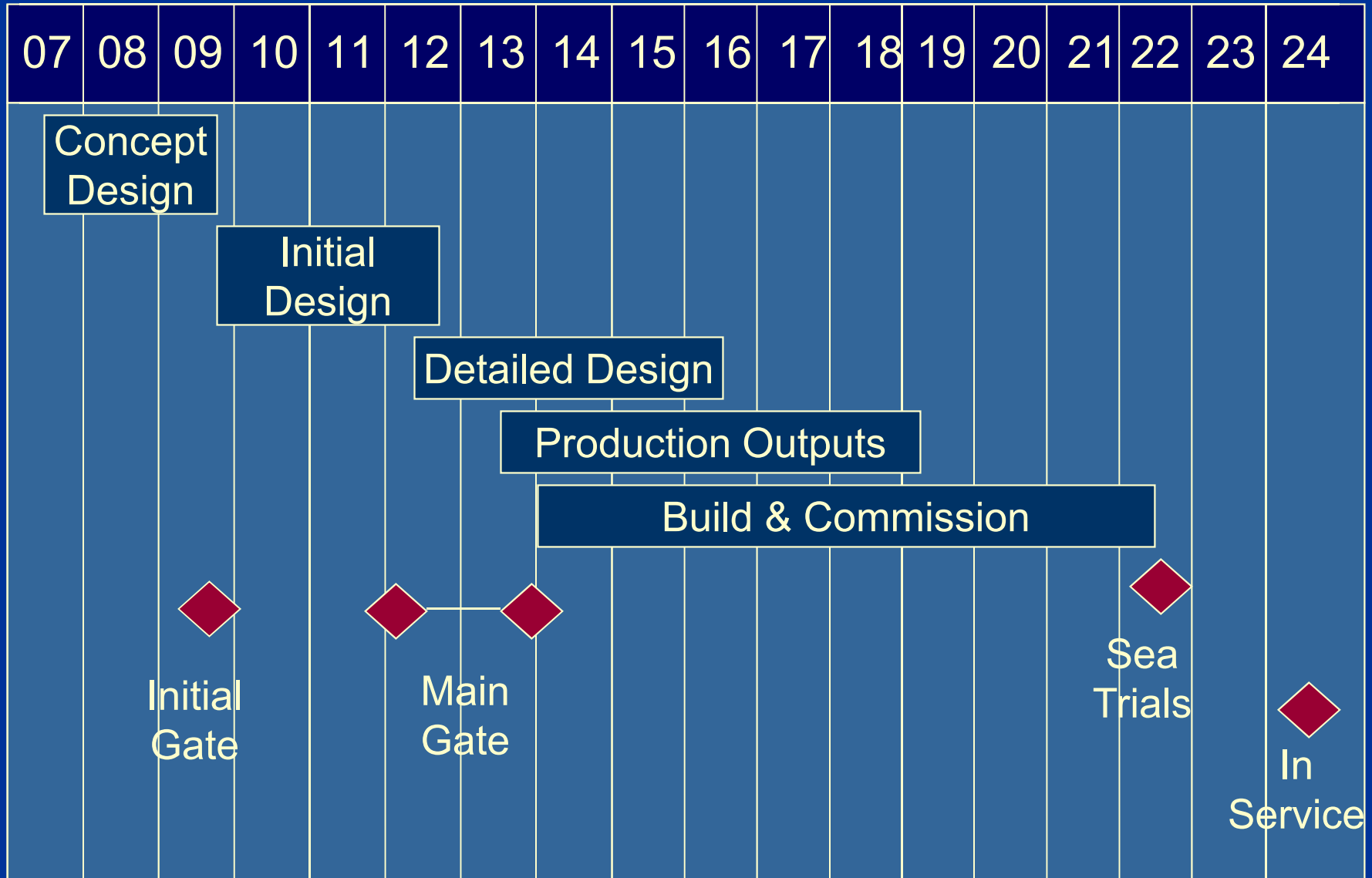
Reactor choice may be difficult



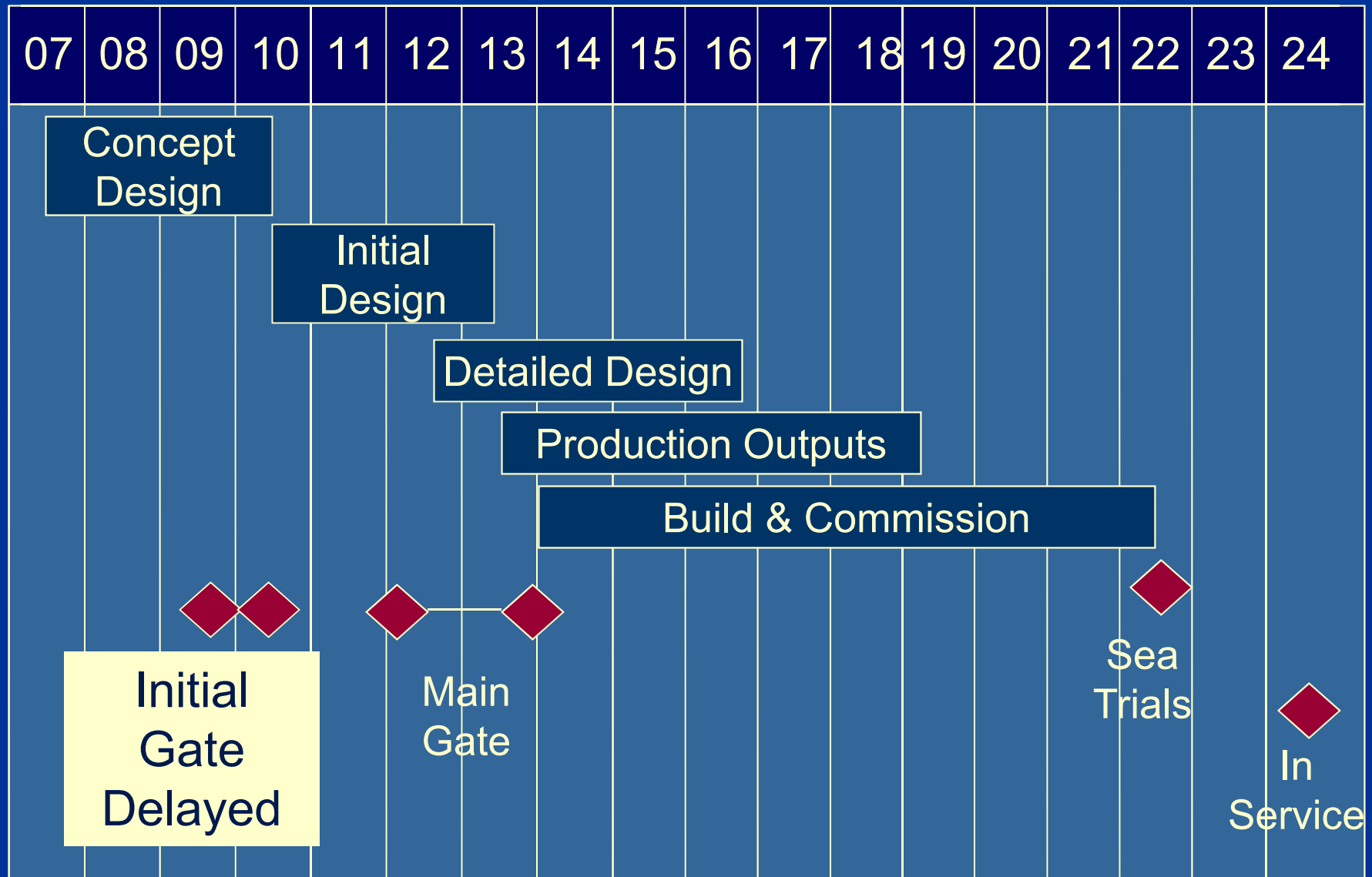
“On the propulsion plant, that is from my point of view the most tricky issue we have to deal with in the run up to Initial Gate”

Guy Lester
(Senior Responsible Owner,
Successor Submarine Project)

Original UK Replacement Timeline



Delay to Initial Gate



Delay to Initial Gate



**Defence Board
Meeting
26 Nov 2009**

“The Board also took stock of progress on the successor submarine programme, and the challenges that remained before it could be initially considered by the Investment Approvals Board next July.”

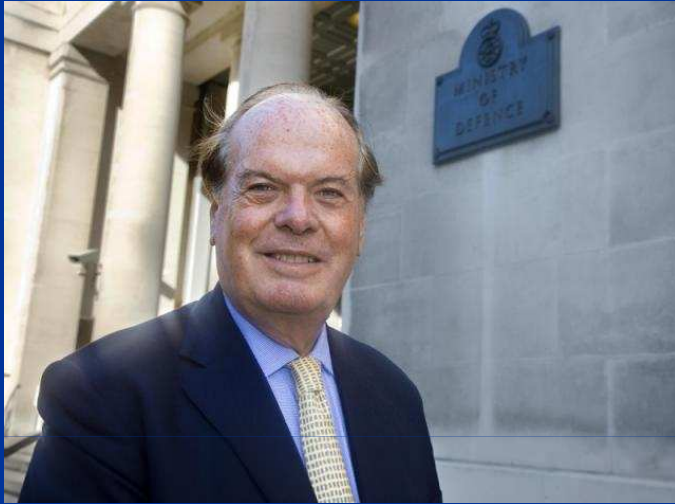
Delay to Initial Gate



Question - Does this mean the initial gate is delayed until July ?

MOD answer – “The language .. is based on an early draft minute .. which did not fully describe the position”.

Delay to Initial Gate



Quentin Davies
11 Jan 2010

“We have come up with one or two possible new technical options for the design of the successor class submarine, and we will need a few more months to evaluate those fully before we take a decision.”

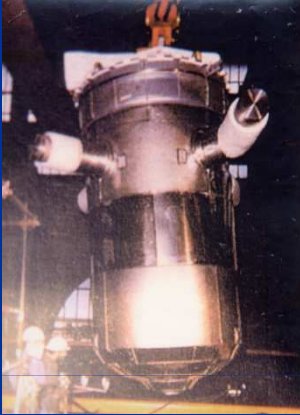
Delay to Initial Gate



Bob Ainsworth
25 Jan 2010

“Progress on the concept phase for the future deterrent has been considered by the Defence Board. More time is required to ensure that we take decisions based on the most robust information. We are aiming to be in a position to make a statement on progress soon.”

Reasons for Initial Gate Delay



Technical

“challenges” – Defence Board

“new options” – Quentin Davies



Political

MOD budget crisis

General Election

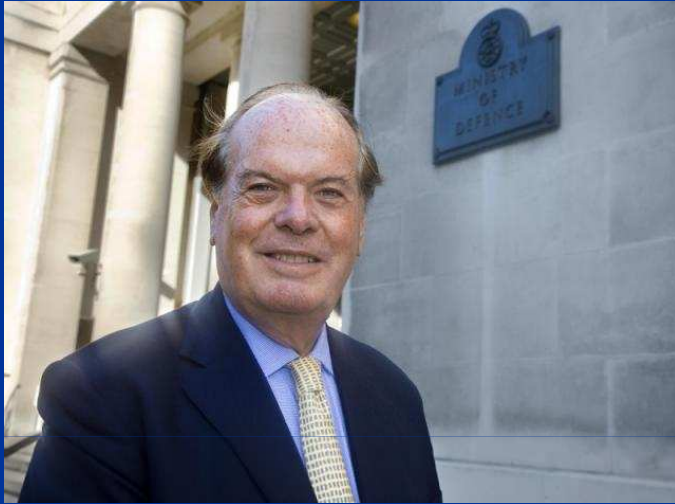
3 or 4 new submarines ?



Gordon Brown
United Nations
23 Sep 2009

“I have asked our national security committee to report to me on the potential future reduction of our nuclear weapon submarines from four to three.”

3 or 4 new submarines ?



Quentin Davies
11 Jan 2010

The study on 3 or 4 submarines will report to the PM shortly.

3 or 4 new submarines ?



?

Reducing to 3 is a small disarmament gesture.

It won't save much money because the 3 subs would need to be more reliable.

The Navy will argue they need 4.

It raises the issue of whether Continuous At Sea Deterrence (CASD) is really needed.



Defence Review

Green Paper published 3 February 2010.

Trident is not an issue in the Green Paper because the decision was taken in December 2006 to replace the deterrent – Bob Ainsworth

A future Conservative Government may also omit Trident Replacement from their Defence Review.

There is a mention of Trident in the Green Paper which gives an opening for submissions to the MOD consultation.

US nuclear warhead programme



Modernise all W76 Trident warheads to W76-1 (2010 – 2021)



Develop new version of bomb – B61-12



Build new warhead facilities.

US parts in UK warheads



AF&F



Neutron
Generator



Gas
Transfer
System

“certain non-nuclear components of the existing warhead are procured from the US on cost-effectiveness grounds. These non-nuclear components include the arming, fuzing and firing system, neutron initiators and gas transfer system”

Bob Ainsworth, 3 December 2009

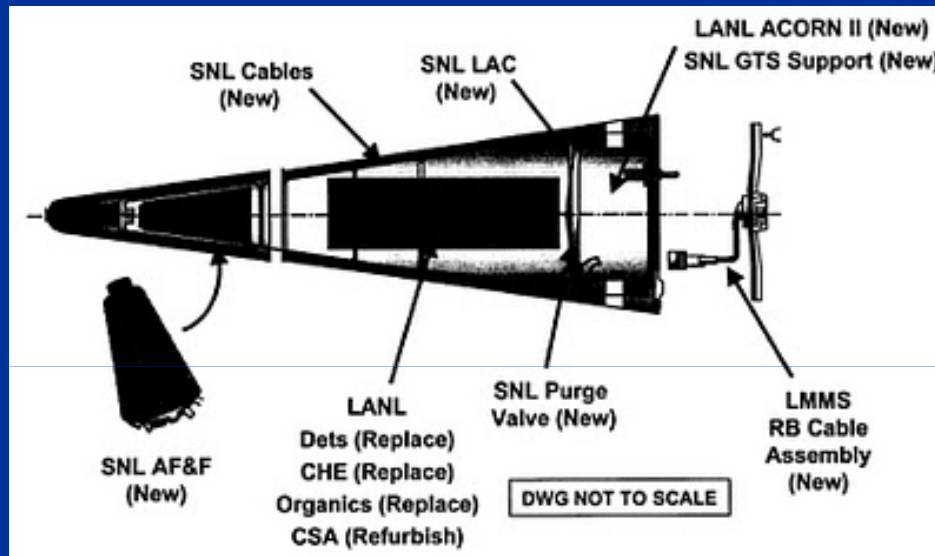
Future UK warhead options

A decision on future warhead options will be made by the “next Parliament”, i.e. the Parliament elected in 2010.

(Future of UK Deterrent, MOD/FCO Dec 2006)

Future UK warhead options

Option 1 Modernise the current warhead.



US W76-1

There is already a UK “Mk4A” refurbishment programme. This includes the new US AF&F. This modernisation may be expanded, in line with current US plans.

Future UK warhead options

Option 2 Build a new warhead



US RRW

This is now less likely as President Obama has scrapped the US Reliable Replacement Warhead program for the time being.

Rebuilding Aldermaston

Supercomputers



Blue Oak installed in 2006.
More powerful supercomputers are planned

Rebuilding Aldermaston

Orion Laser



Construction completed

Rebuilding Aldermaston

High Explosives Fabrication Facility



Planning Permission Granted February 2008

Rebuilding Aldermaston

Warhead Assembly Facility (Burghfield)



Planning Permission Granted March 2009

Rebuilding Aldermaston

**Enriched Uranium Facility
(Manufactures Fusion stage of warhead)**



Planning permission granted February 2010

Rebuilding Aldermaston

Hydrus Hydrodynamic Facility



Planning Application due April 2010

Rebuilding Aldermaston

Other planned developments



Materials Research
Facility

Systems Engineering
Facility

Refurbish A90 Plutonium
Facility

Rebuilding Aldermaston

Expenditure

2005 – 2007	£ 1 bn
2008 – 2010	£ 1.7 bn
2011 - 2013	£ 3 bn
2014 - 2016	£ 2 bn ?
2017 - 2019	£ 2 bn ?
Total	£ 10 bn ?

Conclusions

Announcements are due soon on 3 / 4 subs & Initial Gate.

One of the first decisions of a new Government may be the Trident Replacement Initial Gate.

The new Government will decide on the scale of modernising (or replacing) the Trident warhead.

Cost is a key issue. Can't yet say "the money is already spent".

The next six months will be a key time for the future of the British nuclear weapons' programme.

Trident should be included in any Defence Review.