

The rush to replace Trident

RICHARD L. GARWIN

is an IBM Fellow Emeritus, Thomas J. Watson Research Center, Yorktown Heights, New York 10598, USA.
e-mail: RLG2@us.ibm.com

The question of replacing the UK Trident submarines involves science, technology, national security and international policy. But before the vote, did parliament have access to crucial information? Did the Ministry of Defence?

In December 2006, the UK government issued a joint White Paper¹ by the Ministry of Defence (MOD) and the Foreign and Commonwealth Office (FCO), arguing that it was urgent in this session of parliament to authorize the programme for follow-on submarines to replace the four Vanguard-class submarines — each currently carries 16 US long-range Trident missiles, each equipped to carry 12 warheads but fitted with only three of UK design and production.

On 14 March 2007, the House of Commons voted in support of the government to begin plans to renew the submarines, which will cost an estimated £20 billion. Prime Minister Tony Blair's chief argument for an early decision on the Trident replacement is explicitly that the future is uncertain, and that Britain since the war has always had a nuclear deterrent and cannot give it up. I do not propose that Britain abandon its nuclear deterrent, but only that the government exhibit more rationality in preserving it. (Though I note that the claim that the UK needs nuclear weapons at the level of one percent of that possessed by the US and Russia in order to have an independently operated nuclear deterrent force is an argument that would fit just about every country on Earth and thereby has the most profound implications for — or actually against — non-proliferation of nuclear weapons to additional states.)

The December 2006 White Paper¹ claims a very long interval is necessary before the first replacement submarine would enter service — 17 years from 2007 to 2024 — and that the Vanguard-class submarines were designed for an operating life of 25 years, which could be extended for five years but no further. However,

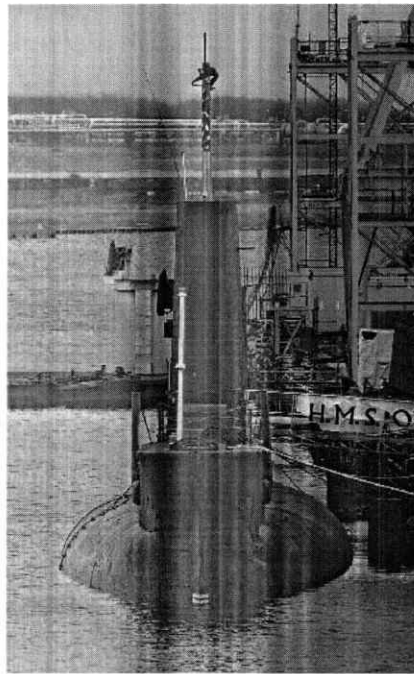


Figure 1 As with the submarine, much of the information in the Trident-replacement controversy is concealed.

given that the US Trident fleet, after a formal inquiry by the navy in 1998, was judged capable of having its operating life extended by 15 years, the basis for the judgment behind the claim that only 30 years of operating life is possible for the UK Tridents in contrast to 44 years for the US Trident submarines is questionable. This shorter lifetime is all the more incomprehensible in view of the UK

government's assertion that only one boat in four was on patrol at any time, compared with two-thirds of the US Tridents at sea at any time. The UK boats do spend time at sea beyond that counted as 'on patrol', but what limits their operating life to 30 years?

The interest in life extension stems from the reduction in expenditures that might thus be achieved. Better value for money would benefit both the MOD and the tax payer. In order for the UK government to take the decision to begin the process of replacing the Vanguard submarines, it should have studied quantitatively the anticipated expenditures for preparing to renew systems that would be at risk during the proposed 15 years of life extension: the discounted present value (DPV) of the expenditure stream that would be required, in comparison with the DPV of the programme to replace the submarines.

In response to the White Paper, several colleagues and I provided written evidence to the House of Commons (see Box 1), in which we estimated that a delay in expenditure by 10–15 years would be worth about £5 billion. Because the government was unable or unwilling to provide parliament with a detailed cost breakdown, we doubt that such information was available to the government in taking its decision to move forward.

Instead, the White Paper indicates that "some major components of the submarines — including the steam generators, other elements of the nuclear propulsion system and some non-nuclear support systems — were only designed for a 25-year life..." According to the US navy, hull corrosion and fatigue are not problematic³. As regards the rest, there is no part of a nuclear submarine that cannot be replaced. In some cases, wide hatches