

Warhead convoy movements summary 2019

The log below is based principally on observations by Nukewatchers, but complemented by deduction as to the purpose of each convoy journey and whether or not warheads were carried.

Nukewatch considers that during 2019 at least two loaded convoys travelled between the Coulport nuclear arms depot in Scotland and the Atomic Weapons Establishment (AWE) at Burghfield in Berkshire, and at least five loaded convoys travelled in the opposite direction. We estimate that between six and twelve nuclear warheads were returned to AWE and between six and thirty warheads dispatched to Coulport. Our best estimate is that six warheads were returned to AWE and fifteen were dispatched to Coulport.

The picture of convoy movements during the year represents a broadly similar level of activity when compared with activity over the past four years. The number of convoys carrying nuclear weapons during 2019 is the same as last year, but is substantially higher than the annual number of such convoys in the first part of the decade.

The pattern of warhead convoy movements observed by Nukewatch is consistent with a programme to rotate warheads between the Coulport warhead store and the Atomic Weapons Establishment for upgrade as part of the UK Trident Mark 4A warhead upgrade programme. This is at a somewhat higher level of activity than the baseline necessary to allow the movement of nuclear weapons for maintenance and surveillance purposes which was observed over the first part of this decade.

During 2018, as with the previous four years, a net surplus of warheads was delivered to Coulport when compared with the numbers returned to the Atomic Weapons Establishment. A considerably larger surplus was observed this year. This suggests that warheads are not currently being decommissioned in line with the pledge to reduce stockpile numbers which was given in the 2015 Strategic Defence and Security Review.

During 2018 no continuous run convoy trips (journeys without an overnight break) were observed to have taken place.

Special Nuclear Materials (SNM) convoys

The Ministry of Defence also transports special nuclear materials and high security cargoes in the same vehicles that are used to move nuclear warheads. Nukewatch has observed one movement of these convoys, which is shown in the log below. One SNM convoy was observed travelling between AWE Aldermaston and RNAD Coulport in July, probably transporting tritium to Coulport.

Nukewatch does not monitor all SNM convoys, and further unmonitored SNM convoys are likely to have also made journeys over the year.

Convoy exercise activities are also thought to have taken place in September and November.

Notes:

- ¹ Report from a member of the public.
- ² Journey made as individual vehicles, not travelling in convoy.
- ³ Remaining vehicles believed to have returned individually, separately to main convoy.

Trident up: The indicated number of Trident warheads was believed to have been transported from the Atomic Weapons Establishment for handover to the Royal Navy at RNAD Coulport.

Return Trident: The indicated number of Trident warheads was believed to have been transported to the Atomic Weapons Establishment for inspection / maintenance / refurbishment.

SNM: Convoy believed to have been carrying special nuclear materials or other sensitive material associated with the Ministry of Defence's nuclear programmes.

Exercise: Convoy believed to have been participating in an exercise, training initiative, or convoy operating procedures inspection.

IF YOU SEE A CONVOY PLEASE RING ONE OF THESE NUKEWATCH NUMBERS AS SOON AS POSSIBLE:

South: 0345 45 88 364
North: 0345 45 88 365
Mobile: 07796 226 488
Mobile: 07790 409 339

We need to know what you saw, when you saw it, where, and what direction the convoy vehicles were travelling in.

For more information please see the Nukewatch website at www.nukewatch.org.uk

Overview of the UK's nuclear weapons programme during 2019

Introduction and context

The United Kingdom was one of the original participants in the Manhattan Project to build the first atomic weapon, and has been a nuclear armed state since 1952. In 2019 the UK marked the fiftieth anniversary of continuous nuclear armed submarine patrols.¹ The nation's nuclear weapons programme has become increasingly technologically dependent on the United States of America, and since 2010 the UK has also co-operated with France on nuclear warhead science.

Under the terms of the 1962 Nassau Agreement, one of the conditions for American support for the UK's programme is that the UK's nuclear weapons are assigned to NATO's nuclear forces and can only be used independently when supreme national interests are at stake.

The UK did not participate in negotiations on the Treaty on the Prohibition of Nuclear Weapons and the government has categorically stated that it will not sign the Treaty.² The extensive modernisation programme for

¹ 'NATO Secretary General marks 50 years of UK submarine nuclear deterrent'. North Atlantic Treaty Organisation, 21 May 2019. https://www.nato.int/cps/en/natohq/news_166172.htm

² Foreign and Commonwealth Office: UK statement on treaty prohibiting nuclear weapons. 8 July 2017.

the UK's nuclear weapons systems are an indication of the country's intention to retain nuclear weapons indefinitely, despite its claim that it is committed to the long-term goal of a world without nuclear weapons³ and contrary to its disarmament obligations under the Non-Proliferation Treaty.

Current status

UK nuclear doctrine and policy is outlined in the 'National Security Strategy and Strategic Defence and Security Review 2015'.⁴ The UK's sole nuclear weapons system is the Trident system, based around the submarine launched Trident D5 missile procured from the USA. The missiles are deployed on four Vanguard class submarines, one of which is constantly on patrol while two others are working up to or recovering from patrol, with the fourth undergoing refit. Each armed submarine carries eight Trident D5 missiles and a total of 40 nuclear warheads. The UK has no more than 120 operationally available nuclear warheads. This is part of a larger stockpile of less than 225 warheads. The Ministry of Defence has indicated that it will reduce the overall stockpile to no more than 180 warheads by the mid-2020s.⁵ Observations of warhead convoy movements undertaken by UK Nukewatch during the first half of the decade suggested that warheads were gradually being removed from service at a rate of around three warheads per year to meet this stockpile reduction target,⁶ although this reduction now appears to have halted.⁷

Modernisation

In July 2016 the UK Parliament reaffirmed its decision to replace the Trident-armed Vanguard class submarines,⁸ which are currently intended to leave service by the early 2030s (significantly beyond their original design life). The successor submarine, now known as 'Dreadnought', entered the design phase in 2011 and the programme is currently in delivery phase 2, which will run until March 2021. Work is now under way on construction of the first two of the four planned new submarines.⁹ Spending commitments of around £2.5 billion have been made this year on the programme.

The Ministry of Defence anticipates that the first submarine will enter into service in the early 2030s (postponed from an earlier target date of 2024) but has been deliberately vague on a precise date.¹⁰ The intention is for the new submarines to remain in service until the 2060s. The new vessels will be the largest submarines ever constructed for the Royal Navy and will each have 12 missile tubes. This leaves open the possibility that the number of missiles carried could be increased.¹¹

The submarines will be powered by a new third generation pressurised water reactor (PWR3), which is being developed with US support and is believed to be similar to the S9G reactor which powers the US Navy's Virginia class submarines.¹² The Trident warhead, although UK built, is believed to be similar to the US W76 warhead and contains a mixture of UK and US elements. The high explosive in the warhead is British.¹³ Three key components are supplied from the US.¹⁴ This warhead is being upgraded to a new Mk4A specification. The Mk4A version will be in service until the 2040s. The modernised warhead will have a new arming, fuzing, and firing system, which will enhance its capability and make it more effective against hardened targets. Evidence from UK Nukewatch

<https://www.gov.uk/government/news/uk-statement-on-treaty-prohibiting-nuclear-weapons>

³ National Security Strategy and Strategic Defence and Security Review 2015, November 2015, para. 4.79
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/478933/52309_Cm_9161_NSS_SD_Review_web_only.pdf

⁴ National Security Strategy and Strategic Defence and Security Review 2015, op cit. P. 34-36.

⁵ Ibid.

⁶ Rob Edwards: "UK's nuclear warheads being dismantled under disarmament obligations". The Guardian, 11 August 2013.
<https://www.theguardian.com/uk-news/2013/aug/11/uk-nuclear-weapons-dismantled-trident>

⁷ See above: Nukewatch UK: 'Warhead convoy movements summary 2019'.

⁸ Rowena Mason and Anushka Asthana: "Commons votes for Trident renewal by majority of 355". The Guardian, 18 July 2016. <https://www.theguardian.com/uk-news/2016/jul/18/mps-vote-in-favour-of-trident-renewal-nuclear-deterrent>

⁹ Ministry of Defence: 'The United Kingdom's Future Nuclear Deterrent: The 2019 Update to Parliament'. 20 December 2019, p2.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/854379/2019_Nuclear_Deterrent_Update_to_Parliament.pdf

¹⁰ John Ainslie, The Trident Shambles, Scottish CND, March 2016.

<http://www.banthebomb.org/images/stories/pdfs/shambles.pdf>.

¹¹ Ibid.

¹² Julian Turner: 'Deep impact: inside the UK's new Successor-Class nuclear submarine'. Naval Technology, 29 July 2013.
<https://www.naval-technology.com/features/feature-nuclear-submarine-successor-uk-royal-navy/>

¹³ The UK Trident warhead contains EDC37, a British explosive, rather than the American equivalent, PBX9501. Ainslie, John: 'The Future of the British Bomb'. WMD Awareness Programme, October 2006.

¹⁴ The UK has purchased three W76 components—the Arming, Fuzing and Firing System, Gas Transfer System and Neutron Generator—from the US. 'Trident missiles'. Parliamentary Written Question. Official Report, 3 December 2009, Column 911W.
<http://www.publications.parliament.uk/pa/cm200910/cmhansrd/cm091203/text/91203w0014.htm#09120373000543>

based on the monitoring of warhead convoy movements suggests that production of the Mk4A warhead is under way and that upgraded warheads are being delivered to the Royal Navy for entry into service.¹⁵

In 2019 the UK is due to make a decision on the production of a new warhead, which would replace the Mk4A. The Atomic Weapons Establishment is conducting research into development of a future warhead and to date over £100 million has been spent on technology studies to support refurbishment of the current system, explore options for a potential future warhead, and inform the decision on whether to refurbish or replace the existing warhead.¹⁶ The Ministry of Defence has indicated that a replacement warhead “is not required until at least the late 2030s, possibly later.”¹⁷

The United States is extending the life of the D5 Trident weapon system, updating all the Trident subsystems: launcher, navigation, fire control, guidance, missile, and re-entry.¹⁸ The UK is participating in this life extension programme and the US will supply the UK with upgraded Trident D5LE missiles and with modernised fire control and navigation systems. Approval was given in 2017 to extend the planned life of the Trident II D5 missile electronic packages, increasing the costs of the missile life extension project to around £350 million,¹⁹ and it is likely that deployment of the life extended missiles on Vanguard class submarines is under way. The life extension programme for the D5 will only sustain the missile until the early 2040s; thus the UK government has acknowledged that “investment in a replacement ballistic missile would eventually be needed.”²⁰

Almost all of the UK’s infrastructure for deploying, developing and building nuclear weapons is being rebuilt or refurbished.²¹ £1.3 billion will be spent over the next ten years to upgrade the Trident submarine base at Her Majesty’s Naval Base Clyde; a £300 million programme is under way to construct new facilities at the BAE Systems shipyard at Barrow-in-Furness where the Dreadnought submarines will be built, and around £1.5 billion has been allocated to construct a new Core Production facility at the Rolls-Royce factory in Derby where PWR3 reactor components will be produced. The Nuclear Warhead Capability Sustainment Programme, a long term infrastructure upgrade programme, has been under way at the Atomic Weapons Establishment since 2005 and new joint Anglo-French hydrodynamic research facilities for warhead research work are under construction at Valduc in France under the auspices of Project Teutates.²²

Budget

The National Audit Office has published a figure of £5.2 billion for the annual cost of the Ministry of Defence’s nuclear enterprise, which includes procuring and supporting submarines (including nuclear powered but non-nuclear armed submarines as well as nuclear armed submarines), missiles and warheads, propulsion systems, nuclear-related infrastructure, and managing the enterprise.²³

Replacing the Trident submarines is expected to cost £31 billion.²⁴ Another £10 billion has been put aside to cover any extra costs or spending over the estimate. In addition, extending the life of the current Trident missiles into the early 2040s will cost around £350 million.²⁵ Keeping the current Trident submarines in operation until the early 2030s, a period significantly longer than planned when they were first built, is also expected to cost between £1.2 and £1.4 billion.²⁶

¹⁵ Nukewatch UK: 'Warhead convoy movements summary 2019'.

¹⁶ Trident:Parliamentary Written Answer 122607, 23 January 2018.

<https://www.parliament.uk/business/publications/written-questions-answers-statements/written-question/Commons/2018-01-15/122607>

¹⁷ National Security Strategy and Strategic Defence and Security Review 2015, op. cit., p35.

¹⁸ Statement of Rear Admiral Terry Benedict, Director Strategic Systems Programs, Subcommittee on Strategic Forces of the Senate Armed Services Committee, 9 February 2016.

https://www.armed-services.senate.gov/download/benedict_02-09-16

¹⁹ Ministry of Defence: The United Kingdom’s Future Nuclear Deterrent: The Dreadnought Programme. 2017 Update to Parliament.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/669771/201712202017_Annual_Update_to_Parliament-The_United_Kingdoms_Future_Nu____002_.pdf

²⁰ The United Kingdom’s Future Nuclear Deterrent: The Submarine Initial Gate Parliamentary Report, May 2011.

²¹ Ministry of Defence: The United Kingdom’s Future Nuclear Deterrent: The Dreadnought Programme. 2017 Update to Parliament, op cit.

²² Nuclear Information Service: AWE: Britain’s Nuclear Weapons Factory. Past, Present, and Possibilities for the Future, June 2016. <https://www.nuclearinfo.org/sites/default/files/AWE-Past%2C%20Present%2C%20Future%20Report%202016.pdf>

²³ National Audit Office: 'The Defence Nuclear Enterprise: a landscape review'. 22 May 2018. <https://www.nao.org.uk/report/the-defence-nuclear-enterprise-a-landscape-review/>

²⁴ National Security Strategy and Strategic Defence and Security Review 2015, op. cit., p37.

²⁵ Ministry of Defence: The United Kingdom’s Future Nuclear Deterrent: The Dreadnought Programme. 2017 Update to Parliament, op cit.

²⁶ 'Replacing the UK’s ‘Trident’ Nuclear Deterrent,' House of Commons Library, 11 July 2016, <http://researchbriefings.parliament.uk/ResearchBriefing/Summary/CBP-7353>.

The annual operating costs of Trident are expected to consume about 6% of the defence budget, currently equating to about £2.2 billion.²⁷ In addition to this, a further £20 billion will be spent on operating and rebuilding the Atomic Weapons Establishment over the period 2000 – 2025.²⁸

Perspective

During the past year the UK's nuclear weapons programme continued to attract critical comment from regulators and financial watchdogs over safety standards and programme management concerns.

The Office for Nuclear Regulation (ONR) determined that the Atomic Weapons Establishment sites and the Devonport Royal Dockyard, where submarine refit work takes place, would remain under a regime of “enhanced regulatory attention” because of safety concerns and the age and condition of key facilities at these sites, and delays in building new facilities. During the year lack of progress by AWE in achieving safety improvements caused a high-profile Chief Nuclear Inspector's inspection at AWE to be postponed, and ONR issued a formal improvement notice requiring AWE to improve its organisational capability arrangements²⁹.

The Ministry of Defence ceased to routinely publish annual status reports from its Defence Nuclear Safety Regulator (DNSR) on nuclear safety assurance in 2016, raising further concerns that the defence nuclear enterprise is facing safety challenges, as well as doubts about the UK's commitment to openness and transparency in its nuclear weapons programme.³⁰

In September 2018 the House of Commons Public Accounts Committee, which scrutinises spending on government projects, warned that “multiple risks” threatened the delivery of the UK's nuclear weapons programme. The Committee continued its critical commentary with a follow-up report on the Ministry of Defence's progress in dismantling out-of-service nuclear powered submarines. The report condemned the “glacial pace” at which progress was being made in dismantling submarines, which it considered “unacceptable and unnecessary”. The Committee warned that the situation was “rapidly approaching crisis point” as it was becoming increasingly likely that no further storage space would be available by the mid 2020s.³¹

A number of programme management risks for the UK's nuclear modernisation projects emerged over the year. The joint UK – France 'Teutates' programme for construction of new warhead hydrodynamic research facilities has experienced increased costs as a result of immature cost and design estimates at earlier stages of the project. The programme is now considered to be “deliverable but challenging”.³² Another programme, to build new nuclear infrastructure at the Clyde submarine base to accommodate new Dreadnought class submarines, has similarly been described as “challenging” by the Ministry of Defence.³³

Construction work for the new 'Project Mensa' warhead assembly / disassembly facility at the Atomic Weapons Establishment, much delayed and considerably over budget, was completed in October 2019 but the National Audit Office considers that the programme remains challenging and that its commissioning will be complex.³⁴

The Core Production Capability project for the production of submarine reactor cores at the Rolls-Royce manufacturing facility at Raynesway was rebaselined, following an assessment by the government's Infrastructure and Projects Authority (IPA) the previous year which indicated that successful delivery of the project appeared to be unachievable. The Ministry of Defence now believes that the project is on track to deliver reactor cores for the

²⁷ Claire Mills and Noel Dempsey: Replacing the UK's strategic nuclear deterrent: progress of the Dreadnought class. House of Commons Library, 31 January 2018.

<http://researchbriefings.files.parliament.uk/documents/CBP-8010/CBP-8010.pdf>

²⁸ Nuclear Information Service: AWE: Britain's Nuclear Weapons Factory. Past, Present, and Possibilities for the Future, op cit., p18.

²⁹ Atomic Weapons Establishment: 'The Office for Nuclear Regulation (ONR) LC36 Improvement Notice'. 19 July 2019.

<https://www.awe.co.uk/2019/07/the-office-for-nuclear-regulation-onr-lc36-improvement-notice/>

³⁰ Rob Edwards: “Black-out: MoD suddenly censors all Trident safety reports”. Sunday Herald, 12 November 2017.

http://www.heraldscotland.com/news/15656024.Black_out__MoD_suddenly_censors_all_Trident_safety_reports/

³¹ House of Commons Public Accounts Committee: '15-year delay to submarine disposal risks costing taxpayer £30 million'. 19 June 2019. <https://www.parliament.uk/business/committees/committees-a-z/commons-select/public-accounts-committee/news-parliament-2017/submarine-defueling-and-dismantling-report-published-17-19/>

³² Ministry of Defence: 'Accounting Officer Assessment for UK / France Teutates Programme'. 4 February 2019.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/778596/20190212_Accounting_Officer_Assessment_for_the_TEUTATES_programme_MSU_4.2.4.6-Min_DP-Penny_Young.pdf

³³ Ministry of Defence: 'Clyde Infrastructure Programme Accounting Officer Assessment'. 15 July 2019.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/818845/20190715_-_Meg_Hillier_Clyde_Infrastructure_Programme_AOA.pdf

³⁴ National Audit Office: 'Managing infrastructure projects on nuclear-regulated sites'. 10 January 2020.

<https://www.nao.org.uk/wp-content/uploads/2020/01/Managing-infrastructure-projects-on-nuclear-regulated-sites.pdf>

submarine construction programme as scheduled.³⁵ The IPA's assessment of confidence in delivery of the Dreadnought submarine construction programme also showed an improved rating when compared with the previous year.

The victory of the pro-Trident Conservative Party in the December 2019 general election means that there is unlikely to be any change in direction for government policy on nuclear weapons, modernisation, or disarmament, at least over the first half of the forthcoming decade. The new government has announced that it will undertake an integrated review of foreign policy, defence, security, and international development which will determine future priorities and doctrine.

³⁵ 'Annual Report on Major Projects 2018 to 2019 - consolidated data and narratives'. Infrastructure and Projects Authority, 18 July 2019.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/817652/Annual_Report_on_Major_Projects_2018_to_2019__consolidated_data_and_narratives.xls