

Warhead convoy movements summary 2018

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 2018 at least three loaded convoys travelled between the Coulport nuclear arms depot in Scotland and the Atomic Weapons Establishment (AWE) at Burghfield in Berkshire, and at least four loaded convoys travelled in the opposite direction. We estimate that between five and eighteen nuclear warheads were returned to AWE and between nine and twenty-four warheads dispatched to Coulport. Our best estimate is that nine warheads were returned to AWE and twelve 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 three years. The number of convoys carrying nuclear weapons during 2018 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 three years, a net surplus of warheads was delivered to Coulport when compared with the numbers returned to the Atomic Weapons Establishment. Nukewatch considers that at this stage it is too early to draw any conclusions about the possible implications of this.

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 some movements of these convoys, which are shown in the log below.

- Two SNM convoys were observed travelling between AWE Aldermaston and RNAD Coulport in March and October, probably transporting tritium to Coulport.
- One SNM convoy was observed in July, possibly transporting highly enriched uranium pellets for submarine reactor fuel from AWE Aldermaston to Rolls-Royce Derby.

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.

**NUKEWATCH
2018 Truck Cargo Heavy Duty (TCHD) Warhead Convoy Log**

Trip purpose	Date Out	Date In	From	To	Load	No trucks	Route
	Tues 30.01.18	Tues 30.01.18	AWE Aldermaston	AWE Burghfield	Unladen	4	
	Wed 31.01.18	Thurs 01.02.18	AWE Burghfield	RNAD Coulport	Unladen	4	A34 M40 M1 A1 M8
3 return Trident	Mon 05.02.18	Tues 06.02.18	RNAD Coulport	AWE Burghfield	Loaded	4	M9 A1 M25 M4
	Wed / Thur 07-08.03.18	Wed / Thur 07-08.03.18	AWE Burghfield	AWE Aldermaston	Unladen	4	
SNM	Wed 07.03.18	Thurs 08.03.18	AWE Aldermaston?	RNAD Coulport	?	3? ¹	M6
SNM	Mon 20.03.17	Tues 21.03.17	RNAD Coulport	AWE Aldermaston	?	3? ¹	M80
	Fri 16.03.18	Fri 16.03.18	AWE Aldermaston	AWE Burghfield	Unladen	4	
3 Trident up	Thurs 22.03.18	Fri 23.03.18	AWE Burghfield	RNAD Coulport	Loaded	4	M25 A1 A66 M74
3 return Trident	Mon 26.03.18	Tues 27.03.18	RNAD Coulport	AWE Burghfield	Loaded	3	M9 A1 A34
	?	?	AWE Burghfield	AWE Aldermaston	Unladen	3	
	Thurs 10.05.18	Thurs 10.05.18	AWE Aldermaston	AWE Burghfield	Unladen	4	
3 Trident up	Wed 16.05.18	Thurs 17.05.18	AWE Burghfield	RNAD Coulport	Loaded	4	M40 A1 A69 M74
3 return Trident	Mon 21.05.18	Tues 22.05.18	RNAD Coulport	AWE Burghfield	Loaded	4	M74 M6
	Thurs 24.05.18	Thurs 24.05.18	AWE Burghfield	AWE Aldermaston	Unladen	4	
	Thurs 28.06.18	Thurs 28.06.18	AWE Aldermaston	AWE Burghfield	Unladen	4	
3 Trident up	Wed 04.07.18	Thurs 05.07.18	AWE Burghfield	RNAD Coulport	Loaded	4	M40 A1 M74 M80
	Wed 05.09.18	Thurs 06.09.18	RNAD Coulport	AWE Aldermaston	Unladen	1	M74 M6 A34 A4
SNM	Tues 17.07.18	?	AWE Aldermaston	Rolls-Royce Derby?	?	? ¹	A34 A46
SNM	?	?	?	AWE Aldermaston	?	?	
	Wed 12.09.18	Wed 12.09.18	AWE Aldermaston	AWE Burghfield	Unladen	?	
	Wed 12.09.18	Wed 12.09.18	AWE Burghfield	?	Unladen	?	
Exercise	Thurs 13.09.18	Thurs 13.09.18	?	AWE Burghfield	Unladen	?	
3 Trident up	Mon 17.09.18	Tues 18.09.18	AWE Burghfield	RNAD Coulport	Loaded	4	M1 M6 M74 M9
	Fri 21.09.18	?	RNAD Coulport	AWE Aldermaston	Unladen	4 ³	

Trip purpose	Date Out	Date In	From	To	Load	No trucks	Route
SNM	Mon 15.10.18	Tues 16.10.18	AWE Aldermaston	RNAD Coulport	?	2? ¹	M6 M74
SNM	Wed 17.10.18	?	RNAD Coulport	AWE Aldermaston	Loaded	2? ¹	M74

Notes:

- ¹ Report from a member of the public.
- ² Remaining vehicles believed to have returned individually, separately to main convoy.
- ³ Journey made as individual vehicles, not travelling in 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 2018

Introduction and context

The United Kingdom was one of the original participants in the Manhattan Project to build the first atomic weapon, has been a nuclear armed state since 1952. Since then, 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 current government has categorically stated that it will not sign the Treaty.¹ The extensive modernisation programme for 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 weapons² 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'.³ 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.⁴ 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.⁵

Modernisation

In July 2016 the UK Parliament reaffirmed its decision to replace the Trident-armed Vanguard class submarines,⁶ 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 first of the submarines is currently under construction. 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).⁷ 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.⁸

The submarines will be powered by a new third generation pressurised water reactor (PWR3), which is being developed with US support. 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.⁹ Three key

¹ Foreign and Commonwealth Office: UK statement on treaty prohibiting nuclear weapons. 8 July 2017.

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

² 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

³ National Security Strategy and Strategic Defence and Security Review 2015, op cit. P. 34-36.

⁴ Ibid.

⁵ 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>

⁶ 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>

⁷ John Ainslie, The Trident Shambles, Scottish CND, March 2016.

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

⁸ Ibid.

⁹ 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.

components are supplied from the US.¹⁰ 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 based on the monitoring of warhead convoy movements suggests that production of the Mk4A warhead has commenced and that upgraded warheads have been delivered to the Royal Navy for entry into service.¹¹

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.¹² The Ministry of Defence has indicated that a replacement warhead “is not required until at least the late 2030s, possibly later.”¹³

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.¹⁴ 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.¹⁵ 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.”¹⁶

Almost all of the UK’s infrastructure for deploying, developing and building nuclear weapons is being rebuilt or refurbished.¹⁷ £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.¹⁸

Budget

Replacing the Trident submarines is expected to cost £31 billion.¹⁹ 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.²⁰ 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.²¹

¹⁰ 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>

¹¹ Warhead convoy movements summary 2016. Nukewatch UK. <http://www.nukewatch.org.uk/wpcontent/uploads/2014/04/Convoy-log-2016.pdf>

¹² 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>

¹³ National Security Strategy and Strategic Defence and Security Review 2015, op. cit., p35.

¹⁴ 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

¹⁵ Ministry of Defence: The United Kingdom’s Future Nuclear Deterrent: The Dreadnought Programme. 2017 Update to Parliament.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/669771/20171220-2017_Annual_Update_to_Parliament-The_United_Kingdoms_Future_Nu____002_.pdf

¹⁶ The United Kingdom’s Future Nuclear Deterrent: The Submarine Initial Gate Parliamentary Report, May 2011.

¹⁷ Ministry of Defence: The United Kingdom’s Future Nuclear Deterrent: The Dreadnought Programme. 2017 Update to Parliament, op cit.

¹⁸ 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>

¹⁹ National Security Strategy and Strategic Defence and Security Review 2015, op. cit., p37.

²⁰ Ministry of Defence: The United Kingdom’s Future Nuclear Deterrent: The Dreadnought Programme. 2017 Update to Parliament, op cit.

²¹ ‘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.²² In addition to this, a further £20 billion will be spent on operating and rebuilding the Atomic Weapons Establishment over the period 2000 – 2025.²³

Perspective

The safety and reliability of the Trident system and its costs continued to be dominant themes in the debate over the UK's nuclear weapons over the year.

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. Over the next ten years the Ministry of Defence will face significant pressures on its nuclear enterprise, including a £2.9 billion affordability gap, a skills gap for nuclear personnel, and the need to modernise supporting infrastructure which the Committee described as “not fit for purpose”.²⁴ This led one civil society organisation to argue that there is a real risk that the government's keystone policy of 'continuous at sea deterrence' could be interrupted in the early 2030s.²⁵ The Committee also called for the Ministry of Defence to be more open about progress being made with management and delivery of the nuclear weapons programme.

In 2012 discovery of a breach in fuel cell cladding at the prototype reactor plant at the Royal Navy's Shore Test Facility at Dounreay led to concerns about the integrity of the reactor which powers Vanguard class submarines. As a precaution, a decision was taken to refuel the oldest of the submarines, HMS Vanguard. In November the Secretary of State for Defence announced that it would not be necessary to undertake a second refuelling for HMS Victorious, the second submarine in the class. No evidence has been presented to justify or explain this decision.²⁶

Concerns over quality of work in the submarine programme emerged when faulty welding was found in missile tubes manufactured for the Dreadnought class submarines in June 2018, requiring assessment and repair work and raising the risk of delays to the submarine construction programme.²⁷

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 serious safety challenges, as well as doubts about the UK's commitment to openness and transparency in its nuclear weapons programme.²⁸ Information from Freedom of Information requests has revealed that since then DNSR has issued three safety improvement notices requiring action to address shortfalls in safety requirements on organisational capability and safety documentation.²⁹

The debate over Scottish independence and the Trident programme has receded slightly over recent months, but remains highly relevant to the future of the Trident programme and can be expected to reawaken if the Scottish National Party continue to perform strongly in the polls.³⁰

²² 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>

²³ Nuclear Information Service: AWE: Britain's Nuclear Weapons Factory. Past, Present, and Possibilities for the Future, op cit., p18.

²⁴ House of Commons Public Accounts Committee: 'Multiple risks to delivery of nuclear deterrent'. 21 September 2018. <https://www.parliament.uk/business/committees/committees-a-z/commons-select/public-accounts-committee/news-parliament-2017/mod-nuclear-budget-report-published-17-19/>

²⁵ Toby Fenwick: '(Dis)Continuous Deterrence: Challenges to Britain's Nuclear Doctrine'. BASIC, 5 November 2018. <https://www.basicint.org/wp-content/uploads/2018/11/DisContinuous-Deterrence-Web.pdf>

²⁶ 'Refuel of HMS Victorious'. Parliamentary Written statement HCWS1065, 5 November 2018.

<https://www.parliament.uk/business/publications/written-questions-answers-statements/written-statement/Commons/2018-11-05/HCWS1065/>

²⁷ Ministry of Defence: 'The Defence Equipment Plan 2019'. 27 February 2020.

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/868076/20200218_EP19_v1_1-O.PDF

²⁸ 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/

²⁹ The Ferret: 'Revealed: Secret report reprimands MoD for nuclear sub safety breaches'. 4 November 2018 The National. <https://www.thenational.scot/news/17199521.secret-report-reprimands-mod-for-nuclear-sub-safety-breaches/>

³⁰ Ministry of Defence: The Equipment Plan 2017 to 2027. National Audit Office, 31

January 2018. <https://www.nao.org.uk/wp-content/uploads/2018/01/TheEquipment-Plan-2017-to-2027.pdf>