CND BRIEFING

Devonport naval base's **nuclear role**

Her Majesty's Naval Base Devonport, in the middle of the city of Plymouth, is where the United Kingdom's submarines – including those armed with Trident missiles and nuclear warheads – undergo refuelling of their nuclear reactors and refurbishment of their systems. This work has potentially hazardous consequences, and the nuclear site has a history of significant accidents involving radioactive discharges.

All of Britain's submarines are nuclear-powered and the four Vanguard-class submarines carry the UK's nuclear weapons system, Trident. One dock at Devonport is specifically designed to maintain these nuclear weapons submarines. Other docks are used to store nuclear submarines that have been decommissioned and await having their nuclear reactors removed and the radioactive metals and components dismantled and sent as nuclear waste for storage.

In 2013 the Ministry of Defence confirmed that Devonport is one of two sites in the UK (the other is Rosyth in Fife) where decommissioned nuclear-powered submarines will be dismantled once a site for the waste has been identified. Radioactive waste will be removed from the boats at the site and transferred to Capenhurst Nuclear Services in Cheshire. This carries the risk of radioactive leaks contaminating the local environment, with possible adverse health and safety effects on the local community. It is therefore particularly worrying that this will take place in Plymouth, which is the largest city on the south coast of Britain with a population of around a quarter of a million people. The base, which is situated alongside schools and housing estates, does not have a good safety record, with various accidents in the past causing radioactive substances to leak into the atmosphere and local river, Tamar.

Dismantling submarines

Britain has 20 submarines waiting to be decommissioned and a further seven which are nearing the end of their shelf life. An interim site for storing nuclear waste was selected in 2016, and so decommissioning work can now begin in Devonport, though a timeline has not yet been announced.

After an initial trial of the radioactive waste removal process at Rosyth, the submarines will be dismantled both there and in Devonport. Submarines will be defueled before the dismantling process begins. Defueling is the most dangerous operation of the entire decommissioning process.

Radioactive Reactor Pressure Vessels (each the size of two double-decker buses and weighing around 750 tonnes) will be removed from the nuclear-powered submarines at both Devonport and Rosyth dockyards and stored intact at Capenhurst, prior to disposal in a planned – but as yet non-existent – Geological Disposal Facility (GDF). The Ministry of Defence (MoD) is yet to find a location for storing intermediate level radioactive waste, and is using storage facilities at Sellafield reprocessing facility which is the subject of separate safety concerns. A new siting process for a GDF – expected to take up to 20 years – was launched in England in December 2018 and in Wales in January 2019.

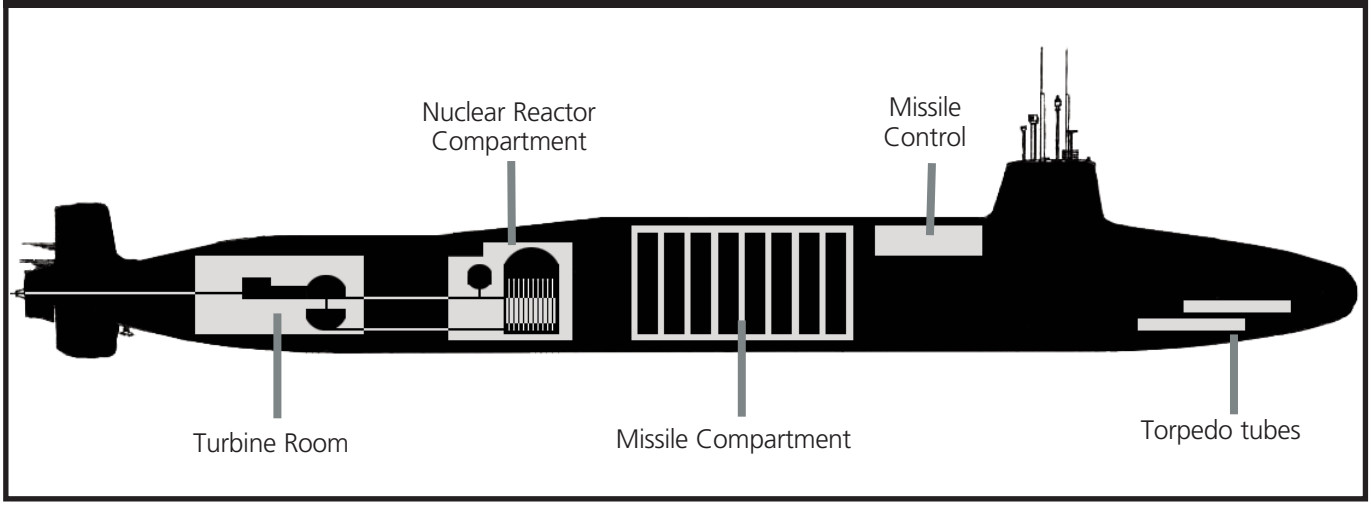
The government has acknowledged that dismantling submarines at Devonport is environmentally 'sensitive'. There are about 25 tonnes of radioactive waste in the reactors of each decommissioned submarine. Local campaigners ran a 10-year campaign of opposition to the proposal for storage facilities to be established at the dockyard, resulting in the proposals being withdrawn.

Refitting nuclear-powered submarines

Devonport Dockyard is the only refit facility for nuclear-powered submarines in the UK. Its work includes servicing the Vanguard class submarines which carry the UK's nuclear weapons. The life of the Vanguard class submarines has been extended until 2032 and so this work will carry on in Devonport for many years to come. Low level radioactive waste from the routine maintenance is disposed of at the dockyard during the process.

After around ten years of service, each of the four nuclear weapons submarines – HMS Vanguard,

Key sections of a Vanguard Class, Trident missile submarine



Victorious, Vigilant and Vengeance – dock unarmed at Devonport for substantial refits. The refit involves the refuelling of the submarine's nuclear reactor. The spent fuel rods, which are highly radioactive, are removed from the submarine and replaced and the whole system is overhauled and updated. Officially, this whole process is termed the 'long overhaul period (refuelling)' or LOP(R).

As the first to be launched, HMS Vanguard was the first to go into refit in February 2002 – the refit took three years six months. HMS Victorious was next and her refit took three years and eight months, resuming patrols in 2009. HMS Vigilant completed a refit in 2012 and HMS Vengeance returned to the sea after a three-and-a-half year refit in December 2015. HMS Vanguard is now back in Devonport for a second time.

Each submarine is powered by a nuclear reactor. At each submarine's refit, the reactor core is replaced. The old reactor core is moved to Sellafield to be stored, as are the spent fuel rods. The reactor heads are radioactive steel domes three feet thick with a diameter of nine feet and weighing up to 28 tonnes. These are removed and replaced during refit to allow the submarines to be refuelled.

Campaigners protested in 2009 and then in 2011 when it emerged that reactor heads removed from the submarines were being cut up at Devonport. As a result of protest, Plymouth will not be a site for interim storage of radioactive waste, with Capenhurst in Cheshire chosen instead.

Radioactive discharges

Radioactive discharges are emitted during the refit process and mainly contain the radionuclides carbon-14, cobalt-60 and tritium. Liquid radioactive waste is discharged via pipeline into the river Tamar and is likely to contain tritium. Tritium is a radioactive element created in the core and coolant system of the nuclear power reactor in the submarines. The coolant water is released from the submarines whilst they are undergoing refit. In the Vanguard class submarines, the water coolant is sealed in the reactor units for much longer, so it becomes more radioactive. This is to avoid its detection in sea water, giving away the position of the submarines when at sea. The Environment Agency therefore approves a discharge level over five times more radioactive than previously allowed, increasing the risk to the people of Plymouth.

Plutonium, americium and tritium, highly toxic radioactive chemicals, have been found on the Plymouth coastline including at a wildlife reserve close to the Dockyard, with a series of spikes in contamination since 2007. Although radioactive discharges from Devonport are said to be at a comparatively low level, there are concerns that tritium may be more harmful than previously thought. Research carried out by the Health Protection Agency concluded that much more research was needed into the effects of tritium. The Environmental Protection Agency in the United States says Tritium can increase the risk of cancer. Plutonium has a half-life of at least 24,000 years and is highly toxic, leading to radiation illness, cancer and often death.

Accidents

Various nuclear accidents have occurred at the site over the past decade. Radioactive water leaked from HMS Turbulent in March 2009, while the reactor's discharge system was being flushed. In November 2008, 280 litres of radioactive liquid poured into the River Tamar after a hose burst. In 2005, refit work was temporarily suspended on HMS Victorious after two radioactive leaks in one week. All in all, at least ten serious nuclear leaks have been reported at Devonport in the last thirty years with 570 litres of radioactive liquid lost overall.

The numerous accidents have led to local people feeling increasingly anxious regarding increased radioactive contamination of their environment. In a government consultation on the submarine dismantling project, many of the responses from the Devonport community raised concerns about the risk of an accident.

Costs

The government has confirmed that at least £243 million will be spent over the next few years on refurbishing the submarine refit complex at Devonport. Additional funding was announced in 2014. The Ministry of Defence refuses to confirm the total

Britain's nuclear-powered submarines

Decommissioned stored afloat at Devonport	Decommissioned stored afloat at Rosyth	Currently in service		Planned
Valiant	Dreadnought	Trenchant[1]		Anson
Warspite	Resolution	Talent[2]		Agamemnon
Conqueror	Repulse	Triumph[3]		Agincourt
Courageous	Renown	Vanguard	Trident nuclear armed	Dreadnought
Sovereign	Revenge	Victorious		Valiant
Splendid	Churchill	Vigilant		Warspite
Spartan	Swiftsure	Vengeance		King George VI
Superb		Astute		
Sceptre		Ambush		
Trafalgar		Artful		
Turbulent		Audacious		
Tireless				
Torbay				

Due to be decommissioned by: [1]2019 [2]2021 [3]2022

amount of public money to be spent on the Submarine Dismantling Project.

Conclusion

CND does not want to see the city of Plymouth become a nuclear waste processing site. The people of Plymouth have the right to live in a safe environment - a city-centre location, on a site a few hundred metres from homes and schools, is no place to store redundant nuclear submarines. The health risks posed by this project are potentially enormous, especially on a site which already has a troubled history of radioactive leaks.

Plans for a marine energy research and development hub at the South Yard of the Devonport base do not fit with the maintenance of the nuclear dockyard in the North Yard and may act as a barrier to inward civil investment. The financial and social cost of the nuclear dock appears to far outweigh any benefits to Plymouth over time.

The government should instead invest in a regenerative strategy for the city, providing long-term sustainable jobs.

1 'Submarine Dismantling Project (SDP): MOD's Response to Consultation', March 2013, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/229356/20130322-MODs_Response_for_web_correct.pdf

2 'Spike in levels of plutonium near Plymouth dockyard – but MoD says no danger to public', Plymouth Herald, 12 February 2016, http://www.plymouthherald.co.uk/spike-levels-plutonium-near-plymouth-dockyard-mod/story-28724441-detail/story.html

3 Advisory Group on Ionising Radiation, Review of Risks from Tritium, Report of the independent Advisory Group on Ionising Radiation, Health Protection Agency, November 2007 https://www.gov.uk/government/publications/tritium-review-of-risks

4 Submarine Dismantling Project (SDP) Post-Consultation Report on the Site for Interim Storage of Waste, July 2015, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/445071/20150713_PSE2_Post-Consultation-FINAL.pdf

5 Hansard, Written Answers, 20 December 2012, http://www.publications.parliament.uk/pa/cm201213/cmhansrd/cm121220/text/121220w0002.htm#12122061004413

6 Hansard, Written Answers, 18 March 2014, http://www.publications.parliament.uk/pa/cm201314/cmhansrd/cm140318/text/140318w0003.htm#140318w0003.htm_wqn69

CND

December 2019. Campaign for Nuclear Disarmament • Mordechai Vanunu House
162 Holloway Rd • London N7 8DQ • 020 7700 2393 • www.cnduk.org