Our narrative has four overlapping themes:

People
We tell the story of the people who have served in the Royal Navy’s submarines. We examine the qualities needed by submariners – courage, determination and humour – and how these have developed within such a unique environment, as crew lives and work within a cramped steel cell throughout their service. We trace the histories of hundreds from 1901 until the present day. We show how submariners have been dismissed as the ‘Trader’, to the revered heroes of two world wars, and finally as an indispensable part of our national security. We show how this is possible because of the people who have served in the submarine service.

Power
We explore how the power of the submarine has revolutionised war at sea, and how advances in technology have shaped different roles for submarines. We examine the use of the submarine as an offensive weapon used to sink enemy warships and merchant ships in both world wars, and in the post-war era when their role as a hunter killer for seeking and destroying enemy submarines was established. We look at how this has taken place by examining the rapid pace of development of the Royal Navy’s submarines and the technologies that underpin them. We chart the transformation in scale from the Navy’s first submarine Holland 1 of 12 tonnes to the current Vanguard class of 15,900 tonnes. We look at how these roles have taken submarines from the margins to the heart of the Royal Navy, and we reflect on how, at times, these roles allow submarines to be independent and, at others, that they require close co-operation with other naval forces.

Purpose
We discuss the rapid pace of development of the Royal Navy’s submarines and the technologies that underpin them. We look at how this has taken place by examining the succession of new technologies that have led to submarines capable of operating at extrem e depths and even under the Arctic ice pack. We also look at how far the cramped, and unhygienic living conditions of crew have changed from diesel boats to the latest Vanguard class of submarines.

Progress
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The following sections outline the key events/developments which have been identified as a focus within our four themes; the sections will also map the NM RN's existing assets to these themes.

### 1901-1918 Origins

1. **Context**
   - **The follow**ing sections outline the key events/developments which have been identified as a focus within our four themes; the sections will also map the NM RN's existing assets to these themes.

2. **People**
   - **The first submarines were few in number** — even during the rapidly expanded service of the First World War — and were very small in size, with the average crew size being 24. Despite these limitations, the early submarines played a significant role in the First World War, serving as scouts, reconnaissance, and mine-sweeping vessels. They were also used as coastal defense and were critical in the Battle of Jutland, where they provided valuable information to the British fleet. The submarines were commanded by Second Lieutenant, and they were often manned by specialists in various fields such as engineering, electro-mechanical, and wireless communications. The early submarines were also equipped with periscopes, which allowed the crew to see above the surface and take aim at targets.

3. **Narrative Sections**
   - **Narrative Sections**
     - **FIGURE 1**
     - **Power**
     - **People**
     - **Purpose**

4. **NM RN RNRS Service Narrative**
   - **People**
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5. **Origins**
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9. **Hands, and five others were lost before 1914. Risks in war were greater still with 82 submarines lost from all causes in the First World War.**
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10. **Service in submarines was hazardous even in peacetime with risks from explosion, collision and accident, often with no hope of escape. In 1916 submarine 21 was lost with all...**
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11. **The role of submarines developed significantly through the First World War. At the outset the role was expected to be limited to coastal defence, but very quickly this expanded into daring offensive operations. Submarines conducted independent attacks against enemy warships, merchant ships and surface ships. Submarines also provided intelligence and reconnaissance and mining. In the latter part of the war three series of types were introduced which were designed for a new role. With their high speed on the surface of over 25 knots, they would be able to support a fleet by operating ahead, providing intelligence and attacking enemy forces encountered.**
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13. **The historical narrative is designed to be an active tool for internal use which will help inform the decisions we need to make to actually tell the story — from collecting strategy, to updates of permanent galleries, to more detailed site development plans.**
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15. **This historical narrative outlines in more detail our story within different periods; we will bring it to life through our museum galleries, collections, historic submarines, special exhibitions, programmes, publications and partnerships.**
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Submarines continued to face hazards and serious accidents in the inter-war years. In the years of peace, accident facilities were still very limited, though escape training did begin with the introduction of X-craft escape trained in 1927. The Service grew to a peak of 10,000 men during the Second World War, capable of launching X-crafts with fewer distractions of rank, when the crews were truly ‘all of one company’. Submarines suffered the highest casualty rate of any of the Navy’s branches; in 1940, a third of all operations in which a submarine was lost was to the crew. The X-craft proved highly pressurised and exhausting environment, where responsibility to concentric operations was happening on the surface – and responsibility for action – in the command structure alone. Those, after young ones, had to make the critical decisions to risk an attack or to ensure the boats survived, many won distinction, many too suffered the consequences of such stress.

Progress
At the outbreak of the war the Submarine Service focused upon operations in the North Sea and the Norwegian coast, targeting German warships and shipping – extending operations into the Bay of Biscay when France was overrun. The greatest successes were in the Mediterranean when the Torch (the ‘Fighting Torch’) campaign against Axis shipping and warships opened up new opportunities, especially in Rommel’s North African campaign – though the success came at a cost with 45 submarines lost for the RN in total. X-craft submersibles were deployed against heavily defended targets, including the Japanese battleship Yamato in 1944. Submarines played a key role in thwarting Special Forces into occupied Europe and in operations to destroy the new Japanese invasion force. Nine Victorian Class were awarded to submarines, of which four were to the X-craft submarine service.

Submarines became increasingly apparent that the submarine’s offensive role would be independent operations against heavy shipping, with 45 submarines lost for the RN in total. The 21-inch Mark VIII torpedo was introduced in 1927 and was to remain in service, with modifications, until the 1950s. In many respects it was German submarine which fond the operational imperative to introduce technical improvements – such as the world’s first boats with increased diving depth to 380 metres. The Royal Navy was slower – for example, to introduce surface radar technology. Construction was significantly improved with the introduction of welding which improved submarine strength and the speed of construction.
Immediately post-war the Submarine Service resumed its establishment of Anti-Submarine patrols; however the potential threat posed by the growing Soviet submarine force was recognised as early as 1947 and intelligence gathering patrols in the northern waters of the Barents Sea began around the same time. Over the following decades Soviet submarine forces grew in strength peaking at approximately 120 boats in the 1980s. Following the Helsinki Agreement of 1975, the OIC committed to supply the UK with Polaris missile technology. The Royal Navy now had key role: tracking Soviet hunter killer and nuclear submarines while also delivering the UK’s own nuclear deterrent. The first British nuclear submarine HMS Resolution was commissioned in 1968 onwards the thousand boats and subsequently the Vanguard class have maintained devolved deterrent patrols providing the UK with its ultimate defence capability. The role of the SKM was primarily anti-submarine but for a period it had the secondary task of Fleet support. Denmark submarine bases in Malta, Singapore, Canada and Australia had been removed and Australia developed its own submarine force.

Progress

After the Second World War it was clear that submarines needed a step change in technology to counter advances in antisubmarine warfare. The wartime submarines were obsolesced with primitive hulls and other measures designed to make them faster and quieter under water and to remove them altogether for a period. This led to a programme of improvements in nuclear submarine design which placed them at great depth whilst still using their diesel engines. The Porpoise and极致ienne class of diesel boats, introduced from 1957, brought a number of significant technical improvements which made them far

immediately after the war the Submarine Service continued to be drawn largely from submarine. However, at least a dozen of engineering personnel boats going to the technical skills had to be developed and for a number of years the service was run on a four-years fixed three-months as eleven one-weekly more vital than ever, and in an environment where some public opinion – e.g. the permanent Peace Camp at Greenham Common – was recognised as early as 1947 and intelligence gathering patrols in the northern waters of the Barents Sea began around the same time. Over the following decades Soviet submarine forces grew in strength peaking at approximately 120 boats in the 1980s. Following the Helsinki Agreement of 1975, the OIC committed to supply the UK with Polaris missile technology. The Royal Navy now had key role: tracking Soviet hunter killer and nuclear submarines while also delivering the UK’s own nuclear deterrent. The first British nuclear submarine HMS Resolution was commissioned in 1968 onwards the thousand boats and subsequently the Vanguard class have maintained devolved deterrent patrols providing the UK with its ultimate defence capability. The role of the SKM was primarily anti-submarine but for a period it had the secondary task of Fleet support. Denmark submarine bases in Malta, Singapore, Canada and Australia had been removed and Australia developed its own submarine force.

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The Upholder Class diesel submarine was introduced in 1989, but as part of post-Cold War defence cuts all four vessels of this class were decommissioned after only a few years’ service; with the paying-off of the last of the Upholder Class in 1994 the Flotilla became an all-nuclear force. From the mid-1990s the Resolution Class ‘Polaris’ force was replaced by the 15,900 ton Vanguard Class submarines that carry the Trident ballistic missile system which, like Polaris, was also purchased from the US Navy.

The SSN force downsized from a peak of 17 hulls to only seven by the early 2000s and the first of the new 8,000 tonne Astute Class SSN was commissioned in 2010 several years late and 19 years after the last of the Trafalgar Class entered service. British ship-building capability – alongside design and project management of procurements – were significantly diminished in this period; co-operation with the US Navy was essential.

The need since 1990 to deliver an expanded range of roles, with a reduced fleet of submarines, has created a different set of challenges for the Submarine Service. Crews are no longer predominantly all volunteers, and recruitment can be a problem. In the restrictions demanded by the Service there is emphasis on professionalism and a dedication to the task, and more everyday life, scoring, silence and yet less visibility are incompatible with expectations that personal lives remain connected through social media. Threats placed on crews have increased further as work packages required to keep an ageing fleet in operation can be long. In fact, in war, better shore facilities have helped people cope, but in times training opportunities have been squeezed and leaves have become difficult to take. Retention of personnel too is a persistent problem because of fewer opportunities for advancement in a reduced fleet; there is a shortage of specialist engineering skills. Despite these challenges individuals have shown admirable flexibility in managing change, but at some point change further in the Service will be required to make the Submarine Service as a whole fit for purpose.

Maintenance of the power of an ageing fleet to deliver these roles has been a significant challenge with reductions in numbers of little and diesel submarines. The submarine base at Faslane (HMS Dolphin) was closed in 1994 and the remaining squadrons are based in either Devonport or Faslane. Staff work to create a single operational base at Faslane is under way.

The Tomahawk missile, with 1,000lb warhead and range of up to 1,000 miles has been a visible sign of submarines active part in recent conflicts; Tomahawk launched against targets in Kosovo (1999), Afghanistan (2001), Iraq (2003) and Libya (2012). Intelligence gathering has been extended along coastlines in the Middle East, and, following a fee improvement in 1993, Royal Navy submarines now provide a regular presence East of Suez.

A reduction in force levels in the 1990s was not matched by a reduction of roles, or of commitments for the Service. The importance of submarines in intelligence gathering has grown, yet further submarine ability to share what they have gathered has been introduced by the introduction of High Data Rate Communications via satellite which has also revolutionised the information provided to submarine commanders in deployment. Continued atasease has been maintained by the Polaris/Trident weapon systems from 1986 onwards, but the SSBNs have added the sub-strategic nuclear role presumably the responsibility of the Royal Air Force.

The Tomahawk land-attack (TLAAM) missile was introduced in the late 1990s and has given SSNs the additional role of power projection through attacking land targets. The Astute Class is fitted with a dry-deck shelter facility - making them the stealthiest way to arrive and insert Special Forces on a foreign shore.

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1990 - PRESENT CHANGING WORLD

# Purpose

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# People

The need since 1990 to deliver an expanded range of roles, with a reduced fleet of submarines, has created a different set of challenges for the Submarine Service. Crews are no longer predominantly all volunteers, and recruitment can be a problem as the restrictions demanded by the Service remove it further from what is normal in general naval service, and from everyday life, scoring, silence and yet less visibility are incompatible with expectations that personal lives remain connected through social media. Threats placed on crews have increased further as work packages required to keep an ageing fleet in operation can be long. In fact, in war, better shore facilities have helped people cope, but in times training opportunities have been squeezed and leaves have become difficult to take. Retention of personnel too is a persistent problem because of fewer opportunities for advancement in a reduced fleet; there is a shortage of specialist engineering skills. Despite these challenges individuals have shown admirable flexibility in managing change, but at some point change further in the Service will be required to make the Submarine Service as a whole fit for purpose.

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