

# DEFENCE NUCLEAR PROGRAMME RISK REGISTER 2012 - 2060

**Although considerable attention has been given over recent months to the costs and benefits of the UK's nuclear weapons programme and proposals to replace Trident, less attention has been given to the risks associated with the programme and its delivery.**

The Defence Nuclear Executive Board (DNEB) within the Ministry of Defence (MoD) maintains a risk register for the defence nuclear programme, and in December 2009 Nuclear Information Service requested a copy of the register from the MoD under the Freedom of Information Act. After a number of appeals we were eventually provided with a redacted copy of sections of the risk register in June 2012.

Using a similar framework to the DNEB document, we have drawn on our own knowledge as observers of the UK nuclear weapons programme to prepare our own assessments of the risks facing the programme. We have quoted text from the DNEB register directly where information is available (sections of the table highlighted in blue), and the remainder is our best assessment of other risks using our own wording. We have assessed the likelihood and impact of risks using a simple 'high, medium, or low' relative rating, although it is likely that DNEB uses a slightly more sophisticated approach than this (the Cabinet Office National Risk Register of Civil Emergencies rates hazards and their likelihoods on a 1-5 scale).

Our risk register identifies a total of 35 risks in six categories (nuclear policy, force delivery, delivery of submarine programme, equipment capability, technology and US co-operation, and nuclear security). We believe two further risks are included in the DNEB risk register which we have not managed to identify in our own register: one in the equipment capability category, and one in the force delivery category.

Altogether 14 high impact risks are listed in our register. The number of low likelihood – high impact risks identified in the register (10) is significant. Although such risks are considered to have a low probability of occurring, there would be serious consequences if they did occur.

The risk register has been prepared to give an evaluation of risks as they stand at the current point in time (July 2012). However, the defence nuclear programme is intended to continue over a relatively long time period, with Trident's successor scheduled to remain in service until 2060. A large majority of the risks listed on the register will persist over the full length of this period, evolving and in some cases increasing over time.

As a general comment, it appears that it will be easier for the Ministry of Defence to manage technical risks rather than the political risks which face the defence nuclear programme. The risks which we consider to have the highest ratings (a total rating of greater than 4 after mitigation, meaning that the risk remains at least medium in terms of both likelihood and impact) are as follows:

#### **Erosion of public and political support for programme:**

The perceived high cost of the nuclear weapons programme at a time when the economy is weak and defence budgets are being cut, together with a less obvious need for nuclear weapons in the post Cold-War period, means that public and political support for the programme has eroded over recent years and may continue to do so. There is relatively little that the MoD can do to mitigate against this risk other than develop a strategy to advocate forcefully for the retention of nuclear weapons.

**Scotland:** Political and public opposition to Trident in Scotland

poses risks to the MoD's nuclear weapons programme. Regardless of the outcome of the 2014 independence referendum, the debate over Scotland's constitutional arrangements will continue for years into the future and further devolution of powers to Scotland may increase the long term potential for the Scottish Government to obstruct or create difficulties for the nuclear weapons programme. The risk can be controlled and reduced by the MoD through a strategy of dialogue and negotiation between the governments in London and Edinburgh.

**Submarine manpower and Nuclear suitable qualified and experienced personnel:** The Royal Navy has experienced a long term downward trend in recruitment to the Submarine Service. Cuts in numbers of service personnel are likely to add to these difficulties. The situation is particularly acute with regard to personnel with the skills and experience necessary to manage nuclear aspects of the submarine and weapons programmes (linking to and potentially increasing nuclear safety risks). The MoD's response to these risks has been to develop a Sustainable Submarine Manning Project which aims to address some of the causes of these recruitment problems.

**Public relations and reputation:** A poor reputation for the defence nuclear programme, based around perceptions that the MoD is not a responsible nuclear operator and that nuclear safety risks are significant, is considered by MoD to have the potential to place constraints on the programme. Other than ensuring that the defence nuclear programme is operated to the highest safety standards, there is little that MoD can do to tackle this risk other than adopt a public relations strategy aimed at enhancing its reputation in this area.

## Understanding Colour Codes

- Unredacted information from DNPRR.
- Unmitigated Risk Factor of 1-2 (low risk).
- Unmitigated Risk Factor of 3-5 (medium risk).
- Unmitigated Risk Factor of 6+ (high risk).

## Understanding Table Headings

- Likelihood:** Relative likelihood of occurrence over the currently planned life of the Defence Nuclear Programme (present - 2060), assessed on a scale of 1 (low) to 3 (high).
- Impact:** Overall relative impact on the Defence Nuclear Programme, assessed on a scale of 1 (low) to 3 (high).
- Control Rating First Figure:** Risk factor (product of likelihood and impact scores) after mitigation measures have been applied.
- Control Rating Second (Bracketed) Figure:** Risk factor before mitigation measures are applied.

Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Nuclear Policy: P1	Impact of civil nuclear programme. <a href="#">[Link to Risk TUS4]</a>	The civil nuclear programme, and in particular plans for new build of civil reactors, will compete for resources with the Defence Nuclear Programme.  Skills: UK nuclear expertise and capability at the national level is limited and restricted to an ageing pool of personnel.  Construction and manufacturing capability: A limited number of contractors have the expertise to undertake high precision nuclear engineering work.	Medium (2)	Medium (2)	Prepare commercial strategies for delivery of the infrastructure construction and submarine programmes.  Use overseas contractors and expertise which can not be engaged on the Defence Nuclear Programme to support the less sensitive civil nuclear programme.  Stagger the civil and nuclear programmes as far as possible and place advance orders for key components.	2(4)	Stable
Nuclear Policy: P2	Public Relations and Reputation.	There is a risk that a poor reputation and inability to get messages across to target audiences places constraints on the Defence Nuclear Programme.	Medium (2)	Medium (2)	1. Nuclear Reputation Strategy endorsed by DNEB and promulgated to PR practitioners.  2. Nuclear Reputation Steering Group (NRSG) tasked with ensuring effective delivery of the strategy to protect and enhance MoD's reputation as a responsible nuclear operator. Tasks: i) Ensure coherence of communications effort on nuclear related matters across MoD in line with agreed strategy, reporting progress to DNEB and updating strategy as required. ii) Identify opportunities and threats relating to nuclear reputation and ensure they are being addressed. iii) Escalate issues to DNEB as required.  3. Engage both within and outside the Department to ensure a coherent and complementary message.	4(4)	Stable
Nuclear Policy: P3	Erosion of public and political support for the Defence Nuclear Programme.	Concerns over costs and questions about need to maintain the Defence Nuclear Programme may result in delay for key decisions, dilution of forces beyond an effective level, or cancellation of the programme.	High (3)	High (3)	Political and media strategy to emphasise the importance of the programme, present it in a positive light, and keep it in the public mind.	7(9)	Increasing

Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Nuclear Policy: P4	Legality.	Advisory opinion from the International Court of Justice (ICJ) states that the threat or use of nuclear weapons would generally be contrary to the rules of international law. The opinion places constraints upon nuclear policy and developments in international law in this field could add to these constraints.	Low (1)	High (3)	<p>1. Ensure that Ministers and key officials understand the implications of the ICJ ruling.</p> <p>2. Ensure that policy on threat or use of nuclear weapons reflects the ICJ ruling.</p> <p>3. In public debate, emphasise elements of the ICJ ruling which are compatible with the possession of nuclear weapons.</p>	1 (3)	Stable
Nuclear Policy: P5	Relations with other nations.	Relationships with states who may oppose the UK's nuclear weapons programme (eg Non-Aligned Movement nations) or who may feel threatened by it (eg BRIC nations) may become strained, leading to difficulties in meeting foreign policy objectives.	Low (1)	Medium (2)	Maintain diplomatic relations focusing on areas of common interest.	1 (2)	Stable
Force Delivery: FD1	<p>Scotland</p> <p>1. The referendum on Scottish independence in 2014 may result in a new Scottish state which is hostile to retaining nuclear weapons. 'Devo-max' could provide the Scottish Government with powers which could be used to obstruct operations and / or limit tax revenue, increasing concerns about affordability.</p> <p>2. Regardless of the outcome of the 2014 referendum, Scottish constitutional issues will remain fluid in the medium term and uncertainties over the impact this will have on the Defence Nuclear Programme will persist.</p>	Infrastructure at the Clyde Submarine Base is unique and could not realistically be replaced elsewhere in the UK without unacceptable expense and reductions in safety and security standards.	High (3)	High (3)	<p>Develop strategy for promoting the security benefits for Scotland of remaining within the Union.</p> <p>Negotiate with an independent Scottish Government to retain basing rights at the Clyde Submarine Base.</p> <p>Investigate options under international law which would allow access to the Clyde Submarine Base to be retained.</p> <p>Work with allies from NATO and the European Union to press an independent Scottish Government to maintain basing rights at the Clyde Submarine Base.</p>	6(9)	Increasing

Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Force Delivery: FD2	Vulnerability of submarine platform / warhead.	<p>1. Advances in anti-submarine warfare and satellite technology may in future allow submarines to be tracked and located underwater.</p> <p>2. Development of anti-ballistic missile technology results in risk that warhead delivery vehicles can be destroyed before reaching target.</p>	Low (1)	High (3)	Maintain research and technological capabilities and continue collaboration with USA on these topics.	2(3)	Stable
Force Delivery: FD3	Robustness of command and control arrangements.	<p>Lines of communication between Prime Minister and submarine must guarantee delivery of launch command.</p> <p>Onshore commanders must be able to transmit targeting information to submarines with certainty.</p>	Low (1)	High (3)	<p>Ability to communicate with submarines by a number of routes (VHF transmission, Skynet, NATO / US networks etc).</p> <p>'Letter of last resort' provides instructions submarine commander in the event of total loss of communication.</p>	2(3)	Stable
Force Delivery: FD4	<p>Submarine Manpower</p> <p>There is a risk that the RN will not have sufficient suitably qualified and experienced personnel (SQEP) to be able to support the manning requirement of the submarine fleet. [Link to Risk DP6].</p>	<p>1. Difficulties in recruiting suitable personnel to the Submarine Service.</p> <p>2. The national and global nuclear engineering skills shortage.</p> <p>3. Falling personnel numbers within the Royal Navy.</p> <p>4. The Maritime Change Programme decision to create a single operating base at HMNB Clyde.</p> <p>5. Impact on crew morale should CASD cease.</p>	Medium (2)	High (3)	<p>1. Implementation of the recommendations of the 1* led strategic review of nuclear programme manpower.</p> <p>2. Sustainable Submarine Manning Project (SSMP) under the Navy Board Change Programme, with work streams to address:</p> <ul style="list-style-type: none"> <li>a. Improvement of quality of life for submariners.</li> <li>b. Recruiting and training of submariners.</li> <li>c. Skills retention and future sustainability.</li> <li>d. Submarine warfare officer branch structure.</li> <li>e. SSBN(F) manning.</li> </ul> <p>3. Permission now granted for female personnel to crew Vanguard class submarines.</p>	4(6)	Increasing
Force Delivery: FD5	Clyde Submarine Base.	<p>Submarine access to sea from the Clyde Submarine Base is available only through narrow waterways and bottlenecks, leaving submarines exiting from the base vulnerable to mining or anti-submarine attack.</p> <p>Non-replacement of Nimrod airborne early warning system increases this risk.</p>	Low (1)	High (3)	<p>RN Fleet and RAF patrols to keep hostile craft and aircraft out of home waters.</p> <p>Employ anti-submarine warfare countermeasures when submarines leave or enter the Clyde.</p> <p>CASD ensures one submarine at sea at all times.</p>	1(3)	Stable
Force Delivery: FD6	Risk on MoD register, but unidentified by NIS.						

Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Delivery of Submarine Programme: DP1	UK Industrial Base. [Link to Risk TUS4]	Erosion of manufacturing capability, cost growth, time delay, and poor performance of contractors due to the timeliness of approvals not generating appropriate consistency of orders, confidence in commitment of the MOD or commercial incentives.	Medium (2)	High (3)	<p>1. Delivery of the efficiency and sustainability benefits associated with the Flotilla Reactor Plant Support (FRPS) contract and Future Affordable &amp; Sustainable Submarine Programme (FASSP) through the maintenance of a predictable drumbeat of submarine production and evolving submarine design programme.</p> <p>2. Develop a capability to benchmark and manage industrial sustainability initiatives across the programme.</p> <p>3. Deliver a Commercial Strategy addressing the coherent delivery of the submarine programme.</p>	3(6)	Stable
Delivery of Submarine Programme: DP2	Supply chain failure.	A significant number of suppliers and contractors, some large and some small, support the Defence Nuclear Programme. Many of these are unique sources of security sensitive components and equipment. There is a risk that poor performance, liquidation of a key supplier, or takeover by interests from a rival state might close a supply route for essential items.	Medium (2)	Medium (2)	<p>1. Develop long term relationships with supply chain. Submarine Enterprise Performance Programme (SEPP – construction and main contractors) and Flotilla Output Management initiative (ongoing support) have been launched to optimise commercial aspects of the submarine programme.</p> <p>2. Pre-purchase materials and equipment where feasible.</p> <p>3. Work with prime contractors to continue to develop diverse supply routes.</p>	3(4)	Increasing
Delivery of Submarine Programme: DP3	Affordability.	The UK economic situation remains weak and recovery is not expected to commence until at least 2017. Public spending will be constrained over this period and the MoD will be no exception, with spending on the Successor programme coming from the departmental budget at the expense of conventional forces. Further economic shocks may result in the programme becoming unaffordable and scaled down or cancelled.	Medium (2)	Medium (2)	<p>Agree contracts at early stages where possible to ensure that the programme remains committed.</p> <p>Political strategy to ensure that Cabinet and Treasury remain committed to the programme regardless of other pressures.</p>	3(4)	Increasing
Delivery of Submarine Programme: DP4	Monopoly suppliers.	Key suppliers in the supply chain (principally BAE Systems, Babcock, and Rolls-Royce, but also smaller companies) are monopoly suppliers, posing value for money risks.	High (3)	Medium (2)	<p>Partnership approach with industry partners to deliver programme to performance, cost, and time.</p> <p>The Submarine Enterprise Performance Programme (SEPP) has been agreed between Tier 1 industrial suppliers and MoD to retain the capability to design, build, and support nuclear submarines, share risks, generate significant savings, and improve delivery.</p>	3(6)	Stable

Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Delivery of Submarine Programme: DP5	Disposal.	Submarine Decommissioning and Disposal Strategy not endorsed and provisioned, leading to an impact on the Defence Nuclear Programme.	Medium (2)	Low (1)	<ol style="list-style-type: none"> <li>1. DNEB agreed a plan for facilities to support disposal.</li> <li>2. Funding achieved in DNEIP 07 for DDLP facilities.</li> <li>3. Conduct a Strategic Environment Assessment to support public consultation.</li> <li>4. Develop a disposal facility as a public demonstrator.</li> <li>5. Publish a Defence Disposal and Decommissioning Strategy, in time to allow the MOD to engage with the NDA review in 2011.</li> </ol>	2(2)	Stable
Delivery of Submarine Programme: DP6	Nuclear Suitably Experienced and Qualified Personnel (NSQEP). [Link to Risk FD4]	<p>Inability to recruit, retain, and develop sufficient nuclear and submarine design qualified personnel will result in an inability to support Defence Nuclear Programme.</p> <p>Growth in the civil nuclear programme, including the Nuclear Decommissioning Authority, could attract MOD, Service, and Industry NSQEP and SMSQEP.</p>	High (3)	Medium (2)	<ol style="list-style-type: none"> <li>1. Establish Career Management for NSQEP across the civil service.</li> <li>2. Expand workforce modelling to include the need for SMSQEP.</li> <li>3. Pursue an enhancement Option in PR10 to deliver career development and recruitment and retention.</li> </ol>	4(6)	Increasing
Equipment Capability: EC1	Warhead reliability.	Ratification of the Comprehensive Test Ban Treaty by the UK means that it is no longer possible to test warheads and thus there may be an element of uncertainty about the reliability of altered or new designs.	Low (1)	High (3)	<ol style="list-style-type: none"> <li>1. Nuclear Weapons Capability Sustainment Programme will give AWE the experimental and modelling ability to validate weapon designs without recourse to underground testing.</li> <li>2. Exchange and peer review of experimental data with US weapons laboratories under the terms of the 1958 Agreement.</li> <li>3. Adopt design and maintenance philosophy which minimises changes to warhead design and components.</li> </ol>	1(3)	Decreasing
Equipment Capability: EC2	Weapon accuracy.	Failure of warhead to explode as intended within a given radius of the target may mean that destruction of hardened target (eg underground command and control bunkers) may not be guaranteed.	Low (1)	Medium (2)	<ol style="list-style-type: none"> <li>1. Rigorous design and testing regime of guidance and fuzing systems undertaken in collaboration with US agencies.</li> <li>2. Missile test firing as part of Demonstration and Shakedown Operations for each submarine following refit.</li> <li>3. Multiple warhead targeting possible if necessary for high value targets.</li> </ol>	1(2)	Stable

Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Equipment Capability: EC3	Risk on MoD register, but unidentified by NIS.						
Equipment Capability: EC4	Risk to CASD (ongoing).	Mechanical failure or accident to submarine(s), or performance failure by contractors, results in failure to maintain CASD. Risk likely to increase as the current flotilla reaches the end of its life.	Low (1)	Low (1)	Current four boat flotilla has successfully maintained CASD for over 40 years. Seafaring procedures and maintenance regimes are designed to minimise the risk of failure.	1(1)	Stable
Equipment Capability: EC5	Risk to CASD (transition). [Link to Risk EC8]	Future Deterrent Programme (platform) does not meet 2028 in service date.	Medium (2)	Low (1)	Continued review of overall requirement set. Initial findings support feasibility of Vanguard life extension to maintain CASD beyond 2024. Further development of this work to substantiate / confirm life extension.	1(2)	Stable
Equipment Capability: EC6	Resource limitations. [Link to Risk TUS3]	Programme costs are greater than those set in the Dec 06 White Paper.	Medium (2)	Medium (2)	Development of platform option sets and review of overall requirement, combined with value engineering approach and evolution of commercial business cost models.	3(4)	Stable
Equipment Capability: EC7	Environmental.	Loss of Crown Immunity requires full compliance with planning legislation for renewal on supporting infrastructure.  SNP have suggested that they will exploit environmental legislation against basing Trident in Scotland.  Potential threat to continued deterrent operations and support from Faslane / Coulport.	Low (1)	Medium (2)	1. Early awareness of potential problems and timelines for planning permission process.  2. Engagement of Scottish legal expertise to advise on issues and strategy.  3. Ensure continued ministerial and cross-Whitehall engagement on this political issue.	1(2)	Stable
Equipment Capability: EC8	Risk to CASD (3 v 4). [Link to Risk EC5]	Three platform flotilla.	Medium (2)	Low (1)	Commission work to review / revisit Alternative Fleet Concept Study findings in order to determine if other methods to increase platform availability can be investigated such that CASD can be maintained with a flotilla comprising three platforms. Matter remains under review as part of submarine design study work.	2(2)	Stable



Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Technology and US Cooperation: TUS1	Supply of Special Nuclear Materials.	<p>The Defence Nuclear Programme relies on the supply of Special Nuclear Materials (Highly Enriched Uranium for submarine reactor fuel and warhead components; tritium as a warhead booster) from the USA under the terms of the 1958 US-UK Mutual Defence Agreement.</p> <p>Tritium is a critical component as a result of its short half life (12 years), meaning it must be replaced relatively frequently.</p> <p>There is a general risk that the 1958 Agreement will become unattractive to future US administrations as US strategic interests shift from the Atlantic to the Pacific, and a specific risk that a future US administration could halt the supply of Special Nuclear Materials to the UK or increase costs to an unacceptable level.</p>	Low (1)	High (3)	<p>1. Renegotiate the 1958 Agreement for a further ten year period (or longer if possible) in 2014.</p> <p>2. Ensure that the 1958 Agreement remains attractive to the US administration by sharing warhead research information with them.</p> <p>3. Maintain top-level political engagement with the USA and ensure foreign and defence policies remain dovetailed to those of the USA.</p> <p>4. Defence Nuclear Materials Strategy outlines procurement and management arrangements. Tritium has been conserved from legacy stockpile and by recovery and recycling from current warhead stockpile. Highly Enriched Uranium strategy adequate for foreseen needs.</p> <p>5. Over long term, consider developing Anglo-France Defence and Security Co-operation Treaty arrangements to allow supply of special nuclear materials.</p>	1(3)	Stable
Technology and US Cooperation: TUS2	Halt in supply of specialist components from US sources.	<p>The Trident programme relies on the supply of specialist components and support from US sources, which are uniquely available from these sources.</p> <p>Critical components include:</p> <ul style="list-style-type: none"> <li>- Components required for Trident D5 missile life extension programme, including guidance and flight control systems.</li> <li>- Successor missiles to replace the Trident D5 missile when it is withdrawn from service in 2042.</li> <li>- Fire control software.</li> <li>- Warhead arming, fuzing, and firing system.</li> <li>- Warhead tritium bottle.</li> </ul> <p>Risk that a future US Administration or major supplier decides to halt co-operation with the UK.</p>	Low (1)	High (3)	<p>1. Develop long term relationships and contracts with supply chain.</p> <p>2. Pre-order and purchase materials. Defence Nuclear Programme is able to sustain a one-year capability for independent action, during which period emergency options can be considered for the UK deterrent.</p> <p>3. Ensure that supply of such components falls within the terms of the 1958 Agreement and has the political support of US administrations.</p> <p>4. Over long term, consider developing Anglo-France Defence and Security Co-operation Treaty arrangements to allow supply / development of specialist components.</p>	1(3)	Stable
Technology and US Cooperation: TUS3	Pound – dollar exchange rate. [Link to Risk EC6]	Adverse changes in the pound – dollar exchange rate would result in an increase in costs of specialist equipment and materials supplied from the USA, with the risk of exceeding budgets.	Medium (2)	Medium (2)	Ensure HM Treasury are aware of this risk and request contingency funding if needed.	3(4)	Stable



Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Technology and US Cooperation: TUS4	Civil Engineering Capacity. [Link to Risk DP1]	Risk of other major UK Construction Activities (2012 Olympics, new civil reactor build, Cross-rail link) competing for limited construction resources.	Low (1)	Medium (2)	1. Develop long term relationships with supply chain.  2. Pre-purchase materials.	1 (2)	Stable
Technology and US Cooperation: TUS5	Erosion of US support.	US government budget constraints, a perception that Europe should be responsible for its own security, and a shift of US strategic interests from the Atlantic to the Pacific pose a potential risk to long term US support for a UK nuclear weapons programme.  An associated risk is that drawdown of the US Atlantic submarine fleet could result in closure of the Kings Bay US Trident base which is currently key to the UK Trident programme.	Low (1)	High (3)	1. Maintain top-level political engagement with the USA and ensure foreign and defence policies remain dovetailed to those of the USA.  2. Ensure that nuclear co-operation remains attractive to the US administration by co-operating on research and development programmes.  3. Over long term, consider developing Anglo-France Defence and Security Co-operation Treaty arrangements to allow supply of special nuclear materials.	2(3)	Stable
Technology and US Cooperation: TUS6	Civil Protest.	<b>Risk of protestor action.</b>  1. Extreme protestor action at a critical location could result in loss of use of a critical asset.  2. A challenge in court to the legality of the programme could result in delay, appeal costs, and possibly require reconsideration of elements of the programme if successful.	Low (1)	Medium (2)	1. Law enforcement and intelligence agencies to identify threats at an early stage.  2. Ministry of Defence Police to adopt appropriate policing strategies.  3. Maintain and regularly review of security arrangements.  4. Obtain legal opinion to ensure that key decisions are robust.	1 (2)	Stable
Nuclear Security: NS1	Malicious action.	Sabotage, cyber-attack, terrorist action, or act of war leading to significant loss of life, loss of a key asset, or radioactive release.	Low (1)	High (3)	1. Law enforcement and intelligence agencies to identify threats at an early stage.  2. Maintain and regularly review security arrangements at facilities involved in the Defence Nuclear Programme and for weapons / radioactive materials in transit.  3. National Security Committee reviews and addresses threats at a national level.	2(3)	Stable
Nuclear Security: NS2	Disclosure of sensitive information.	Disclosure of sensitive information as a result of espionage, loss or theft of records, or inadvertent release may contribute to the proliferation of nuclear weapons to other states or allow countermeasures to be taken against UK nuclear forces.	Low (1)	Medium (2)	1. Maintain and enforce security and personnel vetting arrangements among government personnel and contractors.	1 (2)	Stable

Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Nuclear Security: NS3	Nuclear accident.	Risk of an accident involving the release of radioactive material. Such an accident could have grave economic, social, and health consequences over the long term and cause severe damage to public confidence in the Defence Nuclear Programme and the armed forces more generally.	Low (1)	High (3)	<p>1. Safety procedures and accident response arrangements are laid out in relevant MoD publications. Emergency response is framed around national resilience framework.</p> <p>2. Adopt robust training and exercise programme to ensure personnel understand procedures and can respond adequately to an accident.</p> <p>3. Programme is regulated by the Defence Nuclear Safety Regulator and by civil regulators where sites are licensed.</p>	2(3)	Stable
Nuclear Security: NS4	Conventional accident.	Risk of a serious accident which does not result in a release of radioactive material (eg submarine fire, torpedo explosion, collision) but results in significant loss of life and / or loss of an essential asset.	Low (1)	Medium (2)	<p>1. Safety procedures and accident response arrangements are laid out in relevant MoD publications. Emergency response framed around national resilience framework.</p> <p>2. Adopt robust training and exercise programme to ensure personnel understand procedures and can respond adequately to an accident.</p> <p>3. Programme is regulated by the Defence Nuclear Safety Regulator and by civil regulators where sites are licensed.</p>	2(2)	Stable
Nuclear Security: NS5	Nuclear weapon proliferation.	HMG's intention to continue the Defence Nuclear Programme indefinitely may be seen by some governments as a breach of UK's commitments under Article VI of the Non-Proliferation Treaty, weakening the NPT framework and increasing the risks of other nations developing nuclear weapons programmes.	Medium (2)	Low (1)	<p>1. Maintain counter-proliferation efforts diplomatically.</p> <p>2. Use influence within the United Nations Security Council to tackle instances of proliferation concern.</p>	2(2)	Stable

Risk ID	Risk	Cause	Likelihood	Impact	Mitigation	Control Rating	12 Month Look Ahead Forecast
Nuclear Security: NS6	<p>Global climate change:</p> <p>1. Risk of flood inundation of coastal facilities.</p> <p>2. Increased frequency of extreme weather events reduce operating windows for critical events eg convoy movements of warheads.</p> <p>3. Loss of government capability to manage the Defence Nuclear Programme safely in long term if societal breakdown predicted by worst case climate change scenarios occurs.</p>	Failure to limit or mitigate against climate change caused by rising greenhouse gas emissions.	Low (1)	Medium (2)	Increased resourcing to protect facilities where necessary: nuclear licensed sites are already intended to withstand 1 in 10,000 year events.	1 (2)	Stable

## Glossary

BRIC	Brazil, Russia, India, China
CASD	Continuous At-Sea Deterrence
DDLDP	Defuel, De-equip and Lay Up Preparation
DNEB	Defence Nuclear Executive Board
DNEIP	Defence Non-Equipment Investment Plan
FASSP	Future Affordable and Sustainable Submarine Programme
FRPS	Flotilla Reactor Plant Support
HM	Her Majesty's
HMG	Her Majesty's Government
HMNB	Her Majesty's Naval Base
ICJ	International Court of Justice
MoD	Ministry of Defence
NATO	North Atlantic Treaty Organisation
NDA	Nuclear Decommissioning Authority

NPT	Non-Proliferation Treaty
NRSG	Nuclear Reputation Steering Group
NSQEP	Nuclear Suitably Qualified and Experienced Personnel
PR	Public relations
RAF	Royal Air Force
RN	Royal Navy
SEPP	Submarine Enterprise Performance Programme
SMSQEP	Submarine Suitably Qualified and Experienced Personnel
SNP	Scottish National Party
SQEP	Suitably Qualified and Experienced Personnel
SSBN(F)	Ship Submersible Ballistic Nuclear (Future)
SSMP	Sustainable Submarine Manning Project
UK	United Kingdom
USA	United States of America
VHF	Very High Frequency

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