Integrated Review: Call for Evidence response template

It is recommended that you read the full call for evidence document before completing your response. Please note that the text boxes used in this template can be expanded to accommodate additional text.

Guidance for respondents

- In your response, please clarify which questions you're answering, by referring to the relevant numbers assigned to each question.
- You do not need to respond to all of the questions if they are not all relevant to you, and you may wish to provide a single answer to multiple questions.
- The questions asked are very broad in nature. This is to give you the scope to focus on a specific sub- issue or priority, according to your own, or your organisation's, area of expertise.
- There is no minimum word limit. We strongly encourage a maximum limit of 500 words per question (not including references). We recommend providing responses which contextualise, and summarise the key points of, the evidence they reference, as these are likely to be most effective. Given the volume of responses expected, submissions exceeding this recommended length may not be read in their entirety.
- Please include references in your response where applicable. We request that you include a bibliography at the end of your response, within the box provided. This does not count towards the recommended word limit.

Responses should arrive no later than **Friday 11:59pm BST on 11th September 2020,** with early responses encouraged where possible.

For further information on how we handle your personal data please read the Integrated Review Call for Evidence Privacy Notice.

Please send your response, attaching the papers you have referenced, to:

IRcallforevidence@cabinetoffice.gov.uk

Or alternatively by post to:
Integrated Review Team,
Cabinet Office,
70 Whitehall,
London,
SW1A 2AS

Quoting the reference "**Integrated Review Call for Evidence 2020**"

General Information

1. **Full name (including title)**

Prof Ed Hill

2. **Mark the statement below [X] as applicable.**

[X] I have read the Integrated Review Call for Evidence Privacy Notice and understand that any responses submitted by organisations or representatives of organisations may be published in full.

2. **Are you responding (please mark the relevant box [X]):**

[ ] as an individual (please complete 3 to 5 below)

[X] on behalf of an organisation / company (please complete 6 to 9 below)

If you are responding as an individual:

3. **E-mail address**

4. **Address**

5. **Please mark the statement below [X] as applicable.**

[ ] I have read the Integrated Review Call for Evidence Privacy Notice and am content for my name to be published alongside my response.

[ ] I have read the Integrated Review Call for Evidence Privacy Notice and am not content for my name to be published alongside my response.

The Privacy Notice can be found on the Integrated Review Call for Evidence webpage.

If you are responding on behalf of an organisation / company:

6. Organisation / Company

National Oceanography Centre, UK

7. Position within Company / Organisation

Chief Executive Officer

8. E-mail address

ehill@noc.ac.uk

9. Address

European Way, Southampton, SO14 3ZH.

Call for Evidence questions

1. What are the key opportunities, challenges, threats and vulnerabilities facing the UK now? (Submissions focusing on rapidly evolving areas such as science, technology, data, cyber, and space are particularly welcome.)

2. What are the key global and domestic trends affecting UK international policy and national security out to 2030, and how should the government prioritise its efforts in response to these?

3. What are the key steps the UK should take to maximise its resilience to natural hazards and malicious threats? How can we build a whole of society approach to tackle these challenges?

4. What are the most effective ways for the UK to build alliances and soft power?

5. What changes are needed to Defence so that it can underpin the UK's security and respond to the challenges and opportunities we face? (Submissions focusing on the changing character of warfare, broader concepts of deterrence, technological advantage and the role of the Armed Forces in building national resilience are particularly welcome.)

6. How should the UK change its governance of international policy and national security in order to seize future opportunities and meet future challenges? (Submissions focusing on the engagement of an increasing range of stakeholders while maintaining clear responsibility, accountability, and speed of action are particularly welcome.)

7. What lessons can we learn from the UK's international delivery over the past 5 years? Which are the key successes we should look to develop and build on, and where could we learn from things that didn't go well?

8. How should UK systems and capabilities be reformed to improve the development and delivery of national strategy?

Please provide your response in the box below. Make sure to note the "Guidance for respondents" provided above before completing.

The review of defence requirements should take into account a range of strategic issues relating to the ocean and marine environment. These will require R&D capabilities and technology innovations to address them. The key issues are:

The ocean, especially the deep sea is a scientific, technological, economic, geopolitical and security frontier and as such there are particular security issues to be aware. A resilient strategy will need to take account of issues that could rapidly come to the fore from almost nowhere and several issues concerning the ocean are in that category:

Q1, Q2

The deep sea – quest for deep sea resources, and critical subsea infrastructures

(a) The quest for natural resources including food, energy and strategic minerals is moving into the sea and the ocean , and into ever deeper waters (5km deep and more in some cases) to address shortages on land or concerns about security of supply on land – e.g. strategic minerals such as cobalt to for batter powered vehicles, other strategic minerals needed for green technologies and modern communication technologies. Seabed resources are found in both Exclusive Economic Zones and extended continental shelf claim areas (many contested).as well as in the Area Beyond National Jurisdiction where governance regimes are untested at exploitation phase and some powers may be inclined to test the limits of agreements. There may be increasing competition and tension for strategic resources within a governance framework open to testing;

(b) Significant subsea infrastructures are vital to modern society (95% of all internet traffic and financial services) are transmitted by subsea fibre optic cables, vulnerable to both natural hazards (subsea landslides) and interference both those with sufficient capabilities to operate in deep sea waters.

(c) The US concept of the 'Third Offset Strategy' to outstrip progressive advantages made by strategic competitors is highly relevant to the ocean. The deep sea (below 1,000m) has generally been beyond the bounds of military capabilities and most conventional and nuclear capabilities which mostly operate in the upper ocean. Like space, the very deep ocean (e.g. < 5km deep has the potential to open a new theatre of operations, giving those wo develop the capabilities to operate there (especially covertly) significant advantages.

Q3

Security implication of Rapidly Changing Ocean

(a) Coastal resilience - Population is growing and concentrating fastest in low lying coastal plains and mega cities, many vulnerable to rising sea levels. This issue is not only rising mean sea level (up to0.5m global mean rise by 2021) but the increasing frequency of extreme events. Rising mean levels alone could turn once in a decade flood events into annual events. In addition increased frequency and intensity of storms could also increase risks of more extreme and frequent flooding events. In a number of regions of the world these have scope destabilise societies at the edge of resilience. In some cases the integrity of global supply chains may be at risk. Better knowledge will be needed of the regions particularly at risk of unfolding climate scenarios – which may be compounded by other cumulative impacts

(b) Arctic Ocean – the Arctic ocean is opening rapidly as sea ice extent shrinks and ice thins. There are potential feedback mechanisms which could cause onset of a (summer) ice-free condition of the Arctic to be rapid (few decades) and the possibility should be considered within a strategic defence review. The impact would be to open the Arctic for maritime traffic (cutting transit times from the Far East to Europe up to one third) as well as opening the Arctic region to resource exploitation (fisheries, minerals) as well as maritime military operations. The spaces is already geopolitically contested.

Q2

UK ocean science and technology capabilities

(c) The UK is a global super power in ocean sciences and in many areas of deep sea technology innovation. As the UK's strategic security interests shifted away from maritime security in the 1990s and 2000's some capability was lost and connection between the ocean science research ecosystems and the defence community weakened.

(d) It will also be important that the UK retains key capabilities over the next decade (advanced global class research ships, deep submersibles) necessary to maintain a

scientific presence in the deep sea and in ahead beyond national jurisdiction – not only from a scientific point of view – but to sustain UK strategic presence and sustain the credibility and strength of the UK voice in global ocean affairs through ‘soft power’ and to support emerging defence requirements in the deep sea.

(e) The UK’s National Oceanography Centre has been working more closely with the defence community such as in the development and application of underwater and surface autonomous technologies. The R&D capabilities and its linkages to the defence sector should be considered as an integral part of the defence review in support of the UK’s foreign policy. It does seem clear that a broad range of ocean issues including the few highlighted above) will become increasingly prominent is coming years e.g. FCO Draft International Ocean Strategy 2020.