



Ministry
of Defence

RFI0017
REQUEST FOR INFORMATION

**ANIMAL BIOMECHANICS, MOVEMENT, BEHAVIOURS AND OR
SOLUTIONS INSPIRED BY NATURE FOR NOVEL SURFACE AND
SUB-SURFACE ROBOTICS**

RFI Title: Animal Biomechanics, Movement, Behaviour and or Solutions Inspired by Nature for Novel Surface and Sub-Surface Robotics

Issue Date: 09 May 2022

Reference: RFI0017

Version: 1.0

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1. Introduction

This RFI is not a bidding opportunity but a means by which industry and academia can provide information. Any resulting procurement, or funding activity will be conducted competitively.

Please note:

This RFI expands the scope of RFI0013 released in 2021. This RFI initially is an information gathering exercise. A board made up of specialists from across Defence and academia will review returns inviting a maximum of 24 respondents to present their concept and answer questions to help shape the direction of any future programme. Any future procurement, or funding activity will be advertised in line with public procurement regulations on the Defence Sourcing Portal and Contracts Finder. Any forms submitted should not be used for any information above OFFICIAL and any contact details they include should be business card level (i.e. business email addresses etc) for GDPR reasons.

2. Background

The Royal Navy is progressing its use in uncrewed and autonomous surface and submersible vehicles. NavyX, the experimental arm of the Royal Navy is interested in exploring novel systems and designs. Concepts that maybe based on physical animal biomechanics or behaviours that give an advantage through being more agile, efficient, or stealthy, possibly through having a reduced signature. Evolutionary biomechanics move away from using traditional thrusters, to those inspired by the flapping fins of swimming animals such as fish or penguins. Examples of this may include the unique dual-mode pulse jet and fin movement of squid, how fish form and manoeuvre as a shoal, or how jellyfish move through water with greater efficiency.

Concurrently NavyX also wishes to understand enabling technology and concepts that could accelerate the development of novel solutions in this space, that in time could plug and play, and integrate with multiple system platforms. Novel sensors, power solutions, software, materials and or manufacturing process – maybe in a completely unrelated area such as marine biology, agritech or aquaculture. An example of this could be sensors inspired by nerve endings or mechanoreceptors, or materials that mimic the drag-reducing properties of the tooth-like denticles that cover the skin of sharks.

This RFI therefore aims to understand the technology that is both in development, and that already exists but maybe had not considered a Defence use case. It also seeks to understand what value or competitive advantage could be achieved comparative to existing technology, in what timeframe, and at what cost. This information will be used to inform potential future investment. A funding line for financial year 22/23 in the region of £3m could be drawn on for experimentation or procurement subject to a future competitive tender.

3. RFI intended outcomes

This RFI aims to achieve 4 outcomes:

- 1) Detailed understanding of current and potential technology as informed by evolutionary biomechanics, movement and or behaviours.
- 2) Detailed understanding of the hypothetical advantages and use cases of this technology.
- 3) Detailed understanding of the current and future academic and industry direction, and funding requirements to advance this technology.
- 4) Alignment against MOD problem sets to inform possible procurement and funding strategy.

4. RFI Procedure

Responses to this RFI will be reviewed by a multidisciplinary board, people from different functional areas across Defence including representation from associated academic institutions.

If upon review of your submission any clarifications or additional information is required, you will be contacted using the details provided in your RFI response.

Any details provided in response to this RFI will be used for information purposes only and will not be used to determine the potential suppliers who will be invited to bid, should the authority proceed to tender.

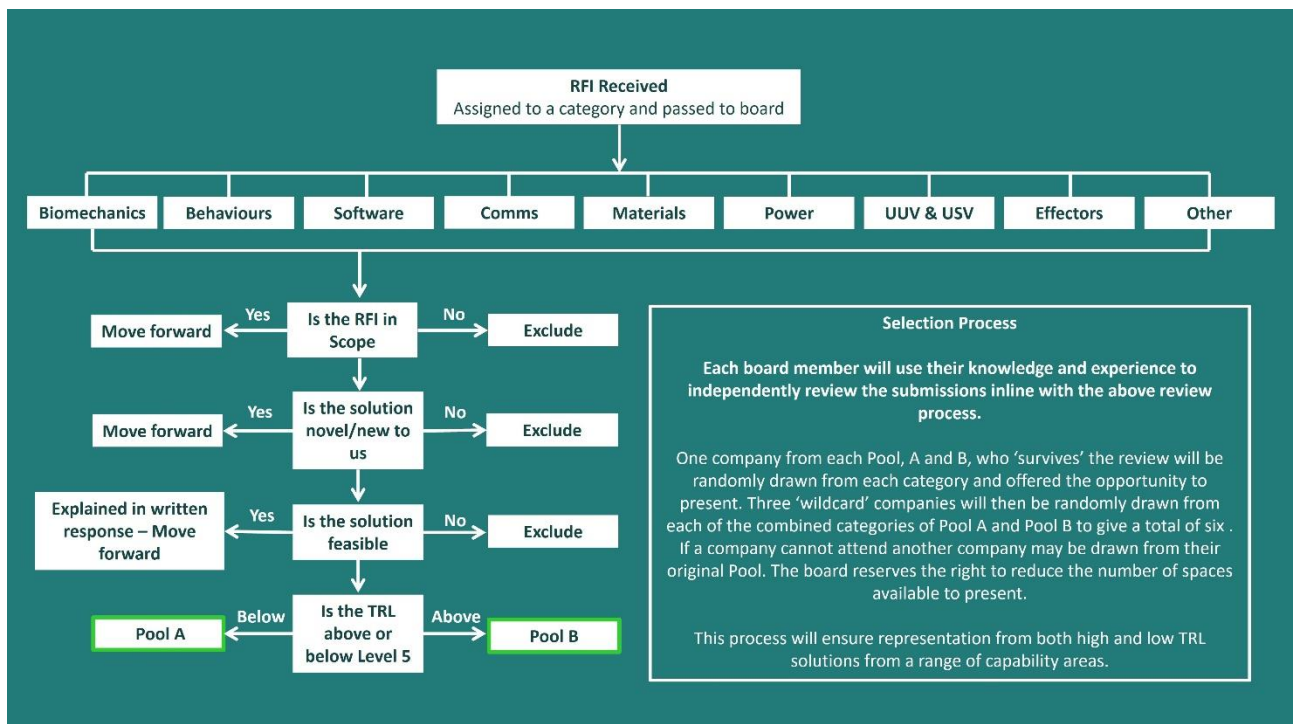
A maximum of 24 participants will be invited to present their concept and engage with the board to help shape and broaden knowledge of this novel area. Should submissions exceed the maximum, respondents will be selected to participate to present as per the selection criteria outlined below at Fig 1. The results and analysis of this RFI, and present day shall not constitute any form of pre-qualification exercise.

Any formal procurement or funding process will be undertaken in accordance with the relevant Procurement Law.

Nothing in this RFI, or any other engagements with industry prior to a formal procurement process, shall be construed as a representation as to the authority's ultimate decision in relation to the future requirement.

To avoid providing a competitive advantage to any organisation/s which may jeopardise future tenders or competitions, RN will not be able to provide any feedback on either element of the RFI submissions (written or presentations). Any requests for feedback on either submission element received by the RN will be disregarded.

Fig 1. Presentation Selection Process.



5. How to submit responses to this RFI

Respondents should in the first instance provide responses via the link to the Microsoft Form below. A manual copy of the Microsoft form is available, available from the contact email address below

Organisations may submit multiple solutions, one solution per form. Invitations to present will be limited to one per company. The RFI is about identifying and expanding the art of the possible, novel solutions and or research.

Please do not submit additional documents such as company overviews, the purpose of the RFI is to collect information related to the technical solution, any additional documents will not be included in the review process.

Any responses received after the deadline will be passed to the subject matter experts for information, however they may not be included in the RFI review meetings which are to be held immediately following the deadline.

Submission of forms should not be used for any information above OFFICIAL and any personal data they include should be business card level for GDPR reasons. The results and analysis of this RFI, and present day shall not constitute any form of pre-qualification exercise.

Please complete the form no later than **12:00, June 6th 2022**.

Responses will be acknowledged electronically by return e-mail.

6. Confidentiality & Proprietary Information

No information included in your response, or in discussions connected to it, will be disclosed to any other third party, but will be reviewed by the board and maybe shared to relevant areas of Defence.

Proprietary information, where included, should be kept to minimum and must be clearly marked.

For the purposes of this RFI, any documentation submitted should be classification OFFICIAL.

7. Costs of preparing your RFI response

Any costs relating to the preparation and submission of a response to this RFI are the sole responsibility of the respondent.

8. Insurance

8.1 The Client shall ensure that at all times during the Term and for a year thereafter, it shall maintain in force, with a reputable insurance company insurance of all risks usually insured for its business. Such insurance shall include public liability insurance to cover all liabilities and any Loss or injury which may occur to any property or to any person arising out of or in connection with the Contract and Services authorised in the amount of not less than five million pounds sterling (£5,000,000) per incident and for

an unlimited number of incidents. The Client shall also maintain professional liability insurance and any other insurance that it may be statutorily required to maintain.

8.2 Upon request, the Client shall promptly forward to the Project Officer certificates of insurance or premium receipts in respect of such insurances. The Client shall upon request provide to the Authority evidence of any renewal of such public liability insurance policies procured by the Client.

9. Contact

All submissions should be via the Microsoft forms link in the first instance, if however, you need to contact us please Quote the RFI reference on all correspondence. Please contact us for:

- i) any requests for clarification
- ii) any errors or form access problems to this RFI and
- iii) any questions regarding Classification of document(s) intended for submission, to:

NAVYCOMRCL-RFI@mod.gov.uk

10. Responding to this RFI

All responses to this RFI should be via the Microsoft forms link below, if you require any clarification, please contact us as per section 9.

Please do not include any personal information in the Form (such as personal email addresses etc.) just business information (for example your business email address etc.). Please keep any information provided via the form to OFFICIAL.

To submit your response, click on the banner below....



Or Visit:

<https://forms.office.com/Pages/ResponsePage.aspx?id=7WB3vINZS0iuldChbfoJ5Z3ADQydWC5LvgEHIMKMg41UN1RUV0pIQU9aSEpBNU9MSKJXUkQ3RjBPOS4u>

