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REQUEST FOR INFORMATION (RFI) TO SUPPORT TYPE 31 57MM AND 40MM OPERATIONAL AND TRAINING NAVAL AMMUNITION EARLY MARKET ENGAGEMENT

Refence: 708848452

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Contents

1. Notice to Reader and Disclaimer

This RFI forms a part of market engagement and is NOT part of any competitive procedure. Any information you submit will be considered in strict confidence for the purposes of achieving the objectives of this RFI that includes building a greater understanding of the marketplace and potential alternative solutions to the current T31 40mm and 57mm Ammunition. Should the decision be made to formally compete the T31 40mm and 57mm Ammunition requirement, any information provided must be resubmitted as part of the formal bid process. Information specific to the industry participant provided through this process will not be shared or distributed directly to other participants but will inform the discussions that MOD will have with industry and may subsequently be used to inform the terms on which the formal procurement process is conducted.

The information contained in this RFI and any further information (whether written, electronic or oral) supplied by the Secretary of State and/or any of its representatives in respect of this RFI is, and will be, supplied on the condition that neither the Secretary of State, any of its representatives nor any agents, servants, officers or affiliates of the Secretary of State or its representatives whatsoever is liable for any error, omission, or inaccuracy therein nor for any loss or damage sustained by any party arising as a result of reliance on such information or any subsequent communication. This includes any error, omission or inaccuracy resulting from any negligent act or omission of any of the Secretary

of State, its representatives, or any other person (other than in respect of fraudulent misrepresentation). No party accepts any responsibility or gives any undertaking to provide further information, including any information required to correct any earlier inaccuracy or error.

Any participation in this industry market engagement and any response to this RFI is entirely at your cost and risk. The MOD is under no obligation to proceed with a formal procurement or in any other way proceed with the T31 40mm and 57mm Ammunition requirement and shall not be liable to any participants for any costs arising from participation in this process.

2. Background

The 40mm and 57mm Gun Systems and Ammunition were offered as part of a competitive bid for T31 Design & Build (D&B) Programme. A comprehensive set of performance modelling was performed to confirm the ammunition and gun selections could satisfy the T31 key characteristics. A key component of the operational 3P ammunition is the programmable nature of the fuze that offers significant capability. The versatility and complexity of the 3P ammunition provides significant advantage against a range of complex threat scenarios. However, the advanced capability offered by 3P does provide a potential through life cost of ownership challenge. As a result, the Authority is interested in identifying potential alternative Value for Money (VfM) ammunition solutions that may provide a suitable level of performance to meet operational requirements at a reduced through life cost of ownership.

The T31 D&B contract will introduce two new gun systems and associated ammunition natures into service with the UK Royal Navy (RN) as detailed below:

- Bofors 57mm Mk3 Naval Gun System
- Bofors 40mm Mk4 Naval Gun System
- Bofors 57mm 3P IM Ammunition
- Nammo 57mm TP Ammunition
- Bofors 40mm 3P IM Ammunition
- Nammo 40mm TP-T Ammunition

These ammunition natures are undergoing qualification for UK Service with the Royal Navy. These ammunition natures provide the initial 40mm and 57mm capabilities for Type 31 and the interim procurement of ammunition is currently proceeding as disclosed within the Voluntary Ex Ante Notice(s) (VEAT) 2022/S 000-031478 and 2022/S 000-032025.

3. Objectives of RFI

The Type 31 40mm and 57mm Training and Operational Naval Ammunition RFI has 4 main objectives:

1. Grow the understanding of the medium calibre naval ammunition market, its readiness, supply chain resilience and competitiveness including key players.
2. Gather knowledge of VfM alternative options from potential bidders to inform the structuring of requirements and specifications.
3. Understand the operational performance of alternative ammunition natures.
4. Inform the Authority’s future considerations in respect of Ammunition Procurement.

4. RFI Timeline

The following project milestones are currently scheduled and form the basis of the current market engagement phase:

Activity	Start	Finish
Publish RFI Notice and Paper on Defence Sourcing Portal	31st August 2023	31st August 2023
Industry Expression of Interest (EOI) and Confidentiality Agreement (where applicable)	1st September 2023	14th September 2023
Industry One-to-Ones	02nd October 2023	13th October 2023
Industry Final Responses to RFI Paper	N/A	31st October 2023
Authority Operational Analysis (OA)	31st October 2023	10th May 2024
Industry Close Out	13th May 2024	17th May 2024

5. Early Market Engagement

5.1. RFI

This RFI is an opportunity for industry to provide information to scope potential alternative solutions for the ammunition compatible with T31 Bofors Naval Gun Systems and the associated commercial construct that may follow. This RFI is not part of a procurement or Pre-Qualification Questionnaire. The Authority shall not reimburse any costs incurred by respondents in connection with the preparation and submission of their responses to this RFI. The Authority requests that responses from industry includes:

a. A brief description of your company and any relevant technical capability information.
b. Response to Annex A – Questionnaire (Sections A-D).
c. Any other information you feel is relevant to this RFI.

5.2. Engagement Opportunities

The Authority's initial engagement opportunity is via this RFI. The Authority reserves the right to schedule one-to-one discussions with industry participants in accordance with the timelines in Section 4. The current intent is to schedule one-to-one sessions following the issue of the RFI paper to provide additional context and clarity to the RFI and rationale to encourage industry to respond to all parts of the questionnaire with relevant and complete data.

5.3. How to Respond to this RFI

This RFI will be advertised on the Defence Sourcing Portal (DSP) and Contracts Finder and issued to all who express an interest in participating within the Early Market Engagement via an RFI.

Responses to this RFI will be reviewed by the Authority's subject matter experts across various Ministry of Defence (MoD) departments which includes Defence Equipment and Support (DE&S), Navy Command Headquarters (NCHQ) and Defence Science and Technology (DSTL). Following receipt of responses to this RFI the Authority reserve the right to engage with individual potential suppliers via one-to-one sessions. This may be undertaken in writing, in person or through virtual meetings.

The results and analysis of this RFI shall not constitute any form of pre-qualification exercise. Any formal procurement process will be undertaken in accordance with applicable 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 respond to this RFI please provide the information specified at 5.1. above and return electronically to jason.piper841@mod.gov.uk. Responses will be acknowledged by email.

5.4. Communicating with the MOD's T31 Project Team

Suppliers wishing to communicate directly with the T31 Project Team are kindly request to direct all enquiries to the single point of contact jason.piper841@mod.gov.uk.

5.5. T31 RFI Updates

Any relevant updates to this RFI will be issued via e-mail to all who express an interest in participating within the Early Market Engagement via an RFI.

5.6. Supplier Questionnaire

Suppliers interested in this project are requested to respond to the questionnaire at Annex A. Where a supplier is unable to provide a response to a particular question it is expected that an explanation is provided.

5.7. Supplier Growth and Opportunity Potential

Suppliers are invited to submit a short paper outlining their expectations for capability enhancements and performance growth with the industry.

5.8. Clarification Questions

All clarification questions regarding this RFI should be addressed to the single point of contact of jason.piper841@mod.gov.uk. Correspondence should cite the unique reference of 708848452 containing the appropriate Government Security Classification. The Project Team will not guarantee a response to any clarification question submitted after 20th October 2023.

5.9. Response Timelines

Suppliers are requested to respond to this RFI by 31st October 2023. Achieving this response date will support the MOD's currently scheduled RFI response review. Responses received after this date may not be reviewed.

5.10. Rough order of Magnitude (ROM) Costs

A ROM cost is required to inform the Authority's future options. Please include ROM costings within your response (question posed at Annex A – Section D), for unit price and associated quantity price breaks. Please note the ROM Cost is for information purposes only and 'subject to contract'.

5.11. Quality Management

Prospective suppliers are required to hold Quality Management System certification to ISO9001:2015 or suitable alternative, with the appropriate scope to deliver contract requirements, issued by a Nationally Accredited Certification Body. Suppliers are not required to provide a copy of the certificate(s) at this time. The contractual condition for quality will be Allied Quality Assurance Publication (AQAP) 2110.

6. Commercial

6.1. MOD Commercial Notice – Subject to Contract

a. This RFI is subject to contract.

b. This RFI is an opportunity for industry to provide market intelligence and information to scope potential alternative solutions for the ammunition compatible with the 40 Mk4 and 57 Mk3 Bofors Naval Gun Systems and the associated commercial construct that may follow. The existence of this RFI does not imply that UK MOD will progress this RFI to a formal procurement.

c. All information provided by UK MOD during discussions with industry is provided in good faith but is indicative only and does not constitute an invitation to tender or an offer of contract.

d. Information received from Industry will be treated as being in the public domain unless specifically noted at the time and in writing as Sensitive Commercial, in which case the confidentiality will be protected by UK MOD.

6.2. Supplier Commercially Sensitive/Confidential Information

Suppliers are requested to clearly and explicitly annotate all commercially sensitive/confidential information provided so that the Authority can manage the provided information correctly and meet supplier expectations.

Suppliers wishing to respond to this RFI with sensitive/confidential information are requested to submit a Clarification Question so that the Authority may determine how we will receive the response document.

6.3. RFI Documentation and RFI Material

RFI Documentation, RFI Material and any Intellectual Property Rights (IPR) in them shall remain the property of the Authority or other Third-Party owners and is released solely for the purposes of enabling your response to this RFI. You must:

a. take responsibility for the safe custody of the RFI Documentation and RFI Material and for all loss and damage sustained to it while in your care.

b. not copy or disclose the RFI Documentation or RFI Material to anyone other than those involved in preparing your RFI Response, and not use it except for the purpose of responding to this RFI.

c. seek written approval from the Authority if you need to provide access to any RFI Documentation or RFI Material to any Third Party.

d. abide by any reasonable conditions imposed by the Authority in giving its approval under sub-paragraph c above, which as a minimum will require you to ensure any disclosure to a Third Party is made by you in confidence. Alternatively, due to IPR issues for example, the disclosure may be made, in confidence, directly by the Authority.

e. accept that any further disclosure of RFI Documentation or RFI Material (or use beyond the original purpose), or further use of RFI Documentation or RFI Material, without the Authority's written approval may make you liable for a claim for breach of confidence and/or infringement of IPR, a remedy which may involve a claim for compensation.

f. inform the named Authority Point of Contact if you decide not to submit a RFI response.

g. immediately confirm destruction of (or in the case of software, that it is beyond use) all RFI Documentation, RFI Material and derived information of an unmarked nature; should you decide not to respond to this RFI.

h. consult the named Authority Point of Contact to agree the appropriate destruction process if you are in receipt of RFI Documentation and RFI Material marked 'OFFICIAL-SENSITIVE' or 'SECRET'.

7. Annexes

A. Questionnaire.

Section A – Organisation Information
Section B – Technical Question Set
Section C – Minimum Technical Dataset to Support DSTL Operational Analysis
Section D – Commercial

ANNEX A - Ammo Questionnaire

This questionnaire is intended to be used to gather information relating to your proposed ammunition system including a technical question set (Section B) focussing on the wider qualification history and data that will be used to inform judgement against likely compliance with UK and NATO Standards and inform the likely scope of qualification/re-qualification effort that may be required by the Authority to introduce your munitions into service. Response to Section C will provide the requisite data to allow the MoD Authority to undertake a performance assessment against the T31 operational requirements.

Some parts of the questionnaire may not be applicable to the proposed solution depending on the nature of the ammunition type and/or design, the relevance of the technical question will be self-explanatory and your response should indicate areas that are not relevant.

Please provide information on the Serials in the Table below and limit your response to 15 pages total (not limited to any technical documents that may be required for section C). Please clearly and explicitly annotate all commercially sensitive/confidential information provided so that the Authority can manage the provided information correctly.

Please outline any assumptions you have made when answering any of the questions in a separate document, limited to 4 pages, referencing the serial they relate to.

Serial No.	Subject	Information Requested
Section A – Organisation Information		
A.1	Company/Organisation Name	
A.2	Company/Organisation Address	
A.3	Is the company a Small Medium Enterprise (less than 250 employees)?	
A.4	Name of Company/Organisation representative completing the RFI	
A.5	Contact details (e-mail and telephone number)	
A.6	Company/Organisation web site address	
Section B -Technical Question Set		
B.1	Organisation pedigree	Provide Experience manufacturing small – medium calibre Naval Gun Ammunition products, including relevant information on the history of 40mm and 57mm ammunition manufacture.

B.2	Ammunition Products	Provide a list of qualified 40mm and 57mm training and operational ammunition that can be supplied with demonstrable compatibility with Bofors 40mm Mk4 and 57mm Mk3 Naval Gun Systems
B.3	Storage	Provide the Storage, Transport and Operational Environments that the ammunition can be used in and can be transited through without degrading safety, performance, or reliability. Including the ammunition's ability to withstand operating in the General Naval Environment as per Defence Standard 00-101. Provide any known environmental restrictions that the ammunition cannot be operated in.
B.4	System Description	Provide a system description for ammunition products available, including design, safety and operational performance. • Including the energetic materials used in the design. • Including operational fuze modes (if applicable). • Provide the packaging solution at an individual and Unit Load Pack level, including details of any testing that has been performed at the unit load and individual ammunition container level. Provide confirmation of an approved Package Performance Certificate (PPC) for the packaging solution.
B.5	Customers.	Provide a list of international customers that currently use the respective ammunition products.
B.6	Shelf Life	Provide the declared Shelf Life of the Ammunition, including the storage conditions applicable.
B.7	ISS	Provide the In-Service Surveillance (ISS) requirements of the ammunition.
B.8	Compatibility with the Bofors Naval Gun Systems	Provide clarification that the ammunition and fuze programming (if applicable) is compatible with the Bofors 40mm Mk4 and 57 Mk3 Gun System.
B.9	Qualification Status	Provide a list of nations that have qualified the ammunition for service.
B.10	Design and qualification standards	Provide a list of design and qualification standards that the ammunition products have been tested and verified against, including but not limited to; a. an exemplar Sequential Environmental Trial Sequence that demonstrates how the lifing of the ammunition has been determined. b. the proposed packaging solution and the nomenclature of the packaging used in any qualification testing. c. the international standards that the energetic materials have been tested and qualified against. d. Fuze qualification testing (if applicable) e. Electrical and Electromagnetic Effects (E3) testing. f. Software System Safety Assessment. g. Electro Explosive Device (EED) characterisation (if applicable). h. Insensitive Munitions Testing. i. Hazard Classification (HC) testing.

		j. Environmental Testing. (Climatic and Mechanical) k. Safety and Suitability for Service (S3) testing (AAS3P-20 or similar internationally recognised standards)
B.11	Insensitive Munitions	Provide the IM Signature for the ammunition in the bare and packaged configuration, including the: - OEM Declared IM Signature. - Qualifying National Authority IM Signature.
B.12	REACH and SVHC	Provide confirmation that ammunition products are compliant with UK, EU and REACH Legislation and declare any substances on the Substances of Very High Concern (SVHC) candidate list.
B.13	Import/Export	Provide any ITAR or export implications of the ammunition or related qualification data.
B.14	HCC	Provide the Hazard Classification Category (HCC) of the ammunition and the classifying National Authority.
B.15	Safety Programme Plan	Provide the System Safety Programme Plan for the ammunition, including the standards applied during the design, development, qualification and through life management of the store.
B.16	Obsolescence	Provide any areas of previous or forward looking technical/obsolescence risk that the Authority should be made aware of, including any supply chain risks. Provide an overview of how obsolescence is managed, including identification, customer notification and resolution of obsolescence.
B.17	Supply chain risk	Provide any areas of technical/obsolescence risk that the Authority should be made aware of, including any supply chain risks.
Section C - Minimum Technical Dataset to Support DSTL Operational Analysis		
C.1	Round summary	Description of the projectile type, including expected lethal mechanism. This must include: 1. Engineering diagrams. 2. Dimensions and masses of the round, including breakdown of functional groups.
C.2	Damage mechanism (provide data as applicable to the round's damage mechanism)	For the following damage mechanisms, the following data is requested: 1. <u>Blast:</u> a. Equivalent Bare Charge (EBC) - The equivalent quantity of uncased TNT explosive. b. If no EBC then: i. Physical quantity of explosive ii. Explosive type (and TNT equivalence factor if possible) iii. Case material iv. Case thickness 2. <u>Fragmentation:</u> a. Fragment materials (case material if naturally fragmenting) b. For each fragment or band of fragments:

		i. Ejection angles (latitude, longitude) ii. Ejection speed iii. Number of fragments iv. Mass of fragments v. Origin relative to projectile centre c. Or Z-data for fragmentation patterns (please ensure that any fragmentation patterns are provided with labelling/explanation of the provided data) 3. <u>Kinetic Energy Penetrator (KEP):</u> a. Mass and materials of the KEP b. Dimensions and nose profile of the KEP 4. <u>Other damage mechanisms (such as incendiary capability)</u> a. Description of damage mechanism. b. Depending on the damage mechanism, further details may be required.
C.3	Fuzing (provide data as applicable to the round's fuzing options)	What fuze type is used? 1. Point detonation. a. Where applicable, is it selectable? b. What is the delay? 2. Detonation delay following impact. a. Where applicable, is it selectable? b. What is the delay? 3. Time delay? a. Where applicable, is it selectable? b. What is the delay? c. How is the delay managed? i.e. ToF 4. Height of burst. a. Where applicable, is it selectable? b. What is the height of burst? c. What is the error on that height of burst? 5. Proximity range. a. Where applicable, is it selectable? b. What is the shape and dimensions of the proximity fuze trigger area? c. What size object is the proximity fuze designed to trigger on? d. Does this vary across the triggering area? e. Are there any error budgets on the above data? If so, what? 6. Details of minimum safety arming distance or safety arming time for round? 7. Fuzing defaults a. If there are multiple fuzing modes, what, if any, is the default factory set fuzing? b. Can this be dictated by the customer?
C.4	Guidance/seeker (where applicable)	1. Detail on how the system works to allow 6 DoF modelling. 2. Limitations of guidance system. 3. Seeker/guidance accuracy.
C.5	Existing modelling data	The gun model DSTL operates uses the inputs listed below. Therefore, any pre-existing lethality workup for the rounds which is ideally given in all metrics below, or at least SSPK. The target set, in decreasing priority is: FIAC, FAC, air targets, FF/DD.

		1. Single shot probability Kill (SSPK) - listed as a % the probability of a single round killing the target given a hit 2. Multi-shot probability Kill (MSPK) – number of rounds required to give XX% certainty of kill, given as a number of rounds e.g 5.5 would mean on average 5 or 6 rounds are required 3. Cumulative p(kill) – is the probability of kill of a single round, the probability is modified based on the number of previous hits, giving a progressive p(kill) curve Where own modelling of FIAC, FAC, air targets, FF/DD has been conducted, please confirm the details of the targets used: 1. Gross Dimensions inc tonnage 2. Organic armour 3. Manoeuvring characteristics inc operational speed brackets, acceleration/deceleration rates, rate of turn, scintillation or perfect motion 4. For air target – operational height brackets 5. RCS size/representation. If existing modelling data has been conducted, an understanding of the data used to generate this will be required, such what gun system or fixed mount/barrel was assumed. Note: Providing the modelling data requested will still require the provision of the other data requested in the section to allow DSTL to conduct independent modelling.
C.6	Paired gun/ammunition system performance	For paired gun/round options: 1. Firing table (out to the weapon's maximum ballistic range) showing the flight profile: a. Muzzle velocity b. Velocity vs range c. Time of flight vs range d. Impact angle vs range e. Environment(s) in which the firing tables were measured 2. Maximum and minimum effective range against small surface targets, large surface targets, air targets. a. Define what you consider "effective range". b. What drives the maximum range? - This includes any self-destruct functions the round has. 3. What drives the minimum range? (safe-arm, gun depression angle, etc?)
C.7	Paired gun/ammunition accuracy	For paired gun/round options (this may depend on how the information has been gathered – in decreasing preference): 1. When fired from a test (Mann) barrel, what is the round to round dispersion (including in depth). This is the preferred baseline. 2. If fired from the operational barrel, what is combined round to round and barrel dispersion (including in depth) 3. What is the dispersion of the complete on mount weapon? (including in depth)
C.8	Tracking sensor, datalink / command link, combat system	**Tracking Sensor** 1. Requirements for a tracking sensor; expect a high resolution system (RF or EO or both). Enough data needed to judge how

	integration, channels of fire (where applicable, likely some guided rounds only)	complex, and expensive, a sensor is needed. (Need to track threats and outgoing rounds?) 2. Search process/timing. Detection range for different threat categories. Number of threats that can be tracked simultaneously. Tracking accuracy and latency. Limitations due to field of view etc. 3. Info on specific systems to enable detailed modelling. a. Radar: frequency, power, antenna (gain, polarisation), track update rate b. EO: optics, detector (including sensitivity). c. Both: scan/search parameters, signal processing techniques, tracking algorithm. **Datalink/Command Link** 1. Overview of Datalink / Command Link system, including latency, frequency and power of emissions. 2. Detailed information on size, weight and power. Also information on emissions characteristics (antenna, frequency, power, waveforms). Enough data to appreciate the impact on ship installation. 3. Details of system to enable modelling, including susceptibility to jamming. (antenna, power, waveforms, signal processing technique). **Combat System Integration** 1. Is the system able to integrate with the ship's combat system? Is the system reliant on other parts of the combat system? 2. Details of the system architecture to enable an assessment on how readily it could be integrated into the ship's combat system. (ie interfaces/standards – 2 way data requirements and latency). **Channels of fire** 1. What is the number of channels of fire that can be supported? 2. What drives the constraint? Tracking sensor, command link, systems issues (eg launched munitions obscuring targets). 3. For the channels of fire, what is the angle coverage over which it can be supported?
Section D – Commercial Question Set		
D.1	Innovation	Describe the top innovations inherent with your current/future solution and how the derived benefits could positively impact on the future capability.
D.2	Interoperability	How interoperable is your product with other gun systems or with previous versions of the Bofors Naval Gun Systems.
D.3	Intellectual property (IP)	Please outline any potential constraints to future MOD rights of use with your current/future solution regarding IPR.
D.4	International export controls	Provide a list of product items that are subject to international export controls. Examples include but are not limited to: • UK Export Control Act • EU Dual Use Regulations • US Department of States (DoS) International Traffic in Arms Regulations (ITAR) • US Department of Defense (DoD) Foreign Military Sales (FMS) programme

		• US Department of Commerce (DoC) Export Administration Regulations (EAR) • Any other international export controls (state those that apply)
D.5	Lead Times	Provide lead times for ammunition manufacture from order to delivery, including lead times for supply of major sub-components including energetic materials and fuzing systems (if applicable).
D.6	ROM	Please provide ROM costings for your products including any associated quantity price breaks.
D.7	Minimum Order Quantities	Provide details of any Minimum Order Quantities
D.8	Risks	Provide details of the key risks you see with the Authority's requirement, and how you would mitigate those risks.
D.9	Guarantees	What form of commercial guarantees do you typically provide to customers?
D.10	Payment Terms	Describe the payment terms that you typically employ in contracts with your customers.