



# **Request for Information**

## **In-Orbit Servicing, Assembly & Manufacturing (ISAM) Payloads**

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## Executive Summary

The UK Space Agency (UKSA) recognises In-Orbit Servicing, Assembly & Manufacturing (ISAM) as a critical capability for strengthening the UK's position in space. The UK Space Industrial Plan (2024) identified ISAM as one of five key space capability areas for prioritisation, reflecting its importance to the nation's future in space. In addition, the Strategic Defence Review (2025) highlighted the need to develop Space Control capabilities, and by extension ISAM technologies, to defend UK space assets in an increasingly contested domain.

Recent years have seen significant progress in establishing the foundations of the UK space sector, with national and defence space strategies now complemented by detailed capability plans. Realising the UK's ambitions for ISAM will require close collaboration between government and industry, with future interventions guided by robust evidence.

To support this, UKSA is issuing this Request for Information (RFI) to organisations - both UK-based and international - developing or planning to develop ISAM payloads or technologies seeking flight opportunities as hosted payloads or on In-Orbit Demonstration (IOD) missions. The aim is to map the landscape of new technologies seeking flight demonstration within the next 3–5 years.

Insights gathered through this RFI will inform UKSA's approach to in-space technology qualification and deepen our understanding of the evolving space technology landscape. We welcome your responses and appreciate your valuable input in shaping the future of the UK's ISAM capabilities.

I am grateful in advance for the time and effort taken in replying to this RFI.

Yours sincerely,



Ray Fielding  
Head of Space Sustainability & ISAM  
UK Space Agency

## How the information you provide will be used and treated

- Responses received together with wider available information will be used to guide UKSA's considerations in relation to supporting the growth of the UK In-Orbit Servicing, Assembly and Manufacturing (ISAM) market. Specifically, this information will support UKSA in designing a prospective In-Orbit Demonstration (IOD) programme for ISAM (subject to HMG Spending Review outcomes).
- Information that you provide, not already in the public domain, will be treated as commercially sensitive information. This means that access to this information will be stored in a protected digital folder restricted to UKSA and DSIT (Department for Science, Innovation and Technology) staff involved with the purpose of this RFI.
- The RFI participation process, including how to send your response appears in the section directly after the RFI Survey below. Please do not hesitate to get in touch with UKSA via the following email if you would like us to take additional steps to receive or store your response: [sustainability@ukspaceagency.gov.uk](mailto:sustainability@ukspaceagency.gov.uk)
- All personal data will be protected according to UK General Data Protection Regulations (GDPR) rules.
- All responses collected will be deleted by 31 December 2028 when we expect all initial activities regarding the purpose would have expired. The information gathered will not be used beyond the stated purpose without explicit permission.

## RFI Terms

- This RFI is intended to be a request for information only. No contractual obligation is expected to arise from this RFI process.
- This RFI does not commit the UK Space Agency to pay any cost incurred in the preparation or submission of any response to the RFI.
- Responding (or failing to respond) to this RFI will not prejudice you from participating in any future RFIs or to tender proposals.

## Definitions

Table 1: Definitions

<b>In-Orbit-Demonstration (IOD)</b>	The process of testing and validating new space technologies or capabilities directly in the space environment to prove their performance, reliability, and readiness for operational use, which otherwise could not be fully validated through ground-based testing alone.
<b>Payload</b>	The specific equipment, instruments, or cargo a spacecraft carries to achieve the mission's primary goals, such as scientific research, communication, navigation, or ISAM services.
<b>In-Orbit Servicing</b>	<p>The maintenance, enhancement, life extension or removal of space objects already in orbit.</p> <p>Examples include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• <b>Last Mile Delivery:</b> The transportation of payloads from a spacecraft's launcher drop-off point to their final destination in space, such as a specific orbital inclination.</li> <li>• <b>Relocation:</b> The process of moving satellites or other space assets from one orbit or position to another to optimise their operational performance or to avoid collisions.</li> <li>• <b>Controlled Deorbiting:</b> The intentional manoeuvring of an operational spacecraft or satellite to safely re-enter Earth's atmosphere, or to a 'graveyard' orbit, at the end of its operational life as a third-party service. This excludes satellite self-deorbiting using on-board propulsion.</li> <li>• <b>Active Debris Removal:</b> The targeted capture and removal of defunct spacecraft, satellites, or parts thereof from orbit to reduce collision risks and maintain an operationally sustainable space environment.</li> <li>• <b>Refuelling:</b> The process of replenishing on-board fuel supplies for operational satellites or spacecraft in orbit, either through dedicated servicing missions or automated self-service facilities.</li> <li>• <b>Attitude and Orbit Control System (AOCS) Takeover:</b> A spacecraft designed to dock with ageing operational satellites in orbit, akin to a 'backpack', to provide propulsion and/or other capabilities to extend (and even enhance) the operational lifespan of the client satellite.</li> <li>• <b>Repairing:</b> Fixing or replacing a spacecraft's faulty/degraded components or equipment in orbit to restore its performance.</li> <li>• <b>Upgrading:</b> Replacing or installing new hardware on a spacecraft in orbit to improve its performance beyond its original design.</li> <li>• <b>Inspection:</b> Checking a space object for damage or health status.</li> </ul>
<b>In-Orbit Assembly</b>	<p>The in-orbit construction and integration of components or structures to build satellites, spacecraft, or other space infrastructure directly in orbit.</p> <p>Examples include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• <b>Modular assembly</b> of spacecraft, such as telescopes with segmented mirrors, and orbital construction platforms.</li> <li>• <b>Construction of large-scale infrastructure</b> including space stations, large refuelling depots, large antennas, giga-watt scale solar arrays, and space-based manufacturing facilities.</li> </ul>

	<ul style="list-style-type: none"> <li>• <b>Robotic assembly systems</b> including platforms that autonomously build or repair structures in orbit.</li> </ul>
<b>In-Orbit Manufacturing</b>	<p>The process of creating products or materials in space that are intended for use in space or on Earth, often leveraging the unique conditions of space to enhance their quality or properties.</p> <p>Examples of In-Orbit Manufacturing applications <b>for use on Earth</b> include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• <b>Advanced Materials and Manufacturing</b> including semiconductors, optical fibres (ZBLAN), nonlinear and linear optical material (KDP crystals), high magnetic materials, thin layer deposition.</li> <li>• <b>Photovoltaics:</b> including vapour deposition and production of relevant crystals such as Silicon and CdTe.</li> <li>• <b>Biopharmaceuticals</b> including protein crystallisation and tissue engineering.</li> <li>• <b>Regenerative Medicine</b> including cell and gene therapy, treatment of deadly diseases, organ growth, and premium skin-care products.</li> <li>• <b>Gene Editing:</b> Using natural radiation in space for mutagenesis, for example to identify approaches to grow more climate resilient crops.</li> </ul> <p>Examples of In-Orbit Manufacturing applications <b>for use in Space</b> include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• <b>3D printing</b> of spare or new parts, enabling spacecraft or space stations to produce tools, brackets, or other components without needing to launch them from Earth.</li> <li>• <b>Recycling and Reprocessing</b> of waste materials in orbit, including space debris.</li> <li>• <b>In-Orbit Extrusion and Curing</b> of resins or other thermosetting/thermoplastic materials launched in raw form.</li> </ul>

## Definition of Technology Readiness Levels (TRLs)

Table 2: TRL summary (as per ECSS-E-HB-11A)

Technology Readiness Level	Milestone achieved for the element	Work achievement (documented)
TRL 1: Basic principles observed and reported	Potential applications are identified following basic observations but element concept not yet formulated.	<ul style="list-style-type: none"> <li>• Expression of the basic principles intended for use.</li> <li>• Identification of potential applications.</li> </ul>
TRL 2: Technology concept and/or application formulated	Formulation of potential applications and preliminary element concept. No proof of concept yet.	<ul style="list-style-type: none"> <li>• Formulation of potential applications.</li> <li>• Preliminary conceptual design of the element, providing understanding of how the basic principles would be used.</li> </ul>
TRL 3: Analytical and experimental critical function and/or characteristic proof-of-concept	Element concept is elaborated and expected performance is demonstrated through analytical models supported by experimental data and characteristics.	<ul style="list-style-type: none"> <li>• Preliminary performance requirements (can target several missions) including definition of functional performance requirements.</li> <li>• Conceptual design of the element.</li> <li>• Experimental data inputs, laboratory-based experiment definition and results.</li> <li>• Element analytical models for the proof-of-concept.</li> </ul>

Technology Readiness Level	Milestone achieved for the element	Work achievement (documented)
<p>TRL 4: Component and/or breadboard functional verification in laboratory environment</p>	<p>Element functional performance is demonstrated by breadboard testing in laboratory environment.</p>	<ul style="list-style-type: none"> <li>• Preliminary performance requirements (can target several missions) with definition of functional performance requirements.</li> <li>• Conceptual design of the element.</li> <li>• Functional performance test plan.</li> <li>• Breadboard definition for the functional performance verification.</li> <li>• Breadboard test reports.</li> </ul>
<p>TRL 5: Component and/or breadboard critical function verification in a relevant environment</p>	<p>Critical functions of the element are identified and the associated relevant environment is defined. Breadboards not full-scale are built for verifying the performance through testing in the relevant environment, subject to scaling effects.</p>	<ul style="list-style-type: none"> <li>• Preliminary definition of performance requirements and of the relevant environment.</li> <li>• Identification and analysis of the element critical functions.</li> <li>• Preliminary design of the element, supported by appropriate models for the critical functions verification.</li> <li>• Critical function test plan. Analysis of scaling effects.</li> <li>• Breadboard definition for the critical function verification.</li> <li>• Breadboard test reports.</li> </ul>

Technology Readiness Level	Milestone achieved for the element	Work achievement (documented)
TRL 6: Model demonstrating the critical functions of the element in a relevant environment	Critical functions of the element are verified, performance is demonstrated in the relevant environment and representative model(s) in form, fit and function.	<ul style="list-style-type: none"> <li>• Definition of performance requirements and of the relevant environment.</li> <li>• Identification and analysis of the element critical functions.</li> <li>• Design of the element, supported by appropriate models for the critical functions verification.</li> <li>• Critical function test plan.</li> <li>• Model definition for the critical function verifications.</li> <li>• Model test reports.</li> </ul>
TRL 7: Model demonstrating the element performance for the operational environment	Performance is demonstrated for the operational environment, on the ground or if necessary in space. A representative model, fully reflecting all aspects of the flight model design, is build and tested with adequate margins for demonstrating the performance in the operational environment.	<ul style="list-style-type: none"> <li>• Definition of performance requirements, including definition of the operational environment.</li> <li>• Model definition and realisation.</li> <li>• Model test plan.</li> <li>• Model test results.</li> </ul>
TRL 8: Actual system completed and accepted for flight ("flight qualified")	Flight model is qualified and integrated in the final system ready for flight.	<ul style="list-style-type: none"> <li>• Flight model is built and integrated into the final system.</li> <li>• Flight acceptance of the final system.</li> </ul>
TRL 9: Actual system "flight proven" through successful mission operations	Technology is mature. The element is successfully in service for the assigned mission in the actual operational environment.	<ul style="list-style-type: none"> <li>• Commissioning in early operation phase.</li> <li>• In-orbit operation report.</li> </ul>

## Request for Information (RFI)

### RFI Survey

**Please complete the survey on Microsoft Forms, linked here:**  
[Request for Information: In-Orbit Servicing, Assembly & Manufacturing \(ISAM\) Payloads](#)

The RFI survey is split into three sections:

1. Organisation & Contact Information
2. Payload Information
3. Potential Impact

A copy of the questions included within each section of this survey is provided below. The guidance provided also accompanies the associated question within the Microsoft Forms survey.

The RFI survey provides the opportunity to submit information on multiple ISAM payloads (section 2. *Payload Information*), up to a total of five.

In each section, please feel free to include as much relevant information as you like. All questions require a free-text response, unless otherwise stated below in square brackets [ ].

Note that questions denoted with an asterisk, \*, are mandatory.

Please provide answers including indications of where answers are actual or anticipated or where the information requested is currently unknown (for example subject to ongoing development).

If useful, you may also respond to questions by providing a link to publicly available information or by referencing a relevant document that contains the information sought. Attachments may be emailed to [sustainability@ukspaceagency.gov.uk](mailto:sustainability@ukspaceagency.gov.uk)

1. Organisation & Contact Information	Guidance
Name of your organisation*	
Registered address*	
Contact name*	
Contact email address*	
Contact phone number	<i>Please include the country code</i>

2. Payload Information	Guidance
	<i>Please complete this section for your payload. If you have more than one payload to provide information on, these questions will be available again for each additional payload.</i>
Provide a name for the payload, if applicable	
Provide the manufacturer of the payload	<i>It may be manufactured in-house, co-developed with a partner organisation, or outsourced, for example.</i>
Briefly describe the objectives of your payload's intended mission/function*	

ISAM Category*	See definitions in the RFI invite [Multiple-choice]: <ul style="list-style-type: none"> <li>• Servicing</li> <li>• Assembly</li> <li>• Manufacturing</li> </ul>			
Payload type*	E.g. instrument, equipment, technology, complete system etc.			
Technical requirements*	Please specify mass (kg), dimensions, power (W), and any unique requirements (e.g. environmental, optical, pointing)			
Data interfaces	Please specify the data interface standards and requirements your payload will need from an IOD platform			
Concept of operations*	Briefly outline how the payload will be operated in orbit			
Delivery timeline for the payload, including key milestone reviews				
Current Technology Readiness Level (TRL) and justification*	As per ECSS-E-HB-11A (see RFI invite). Explain how this was achieved and verified.			
Based on your development timelines, when could you launch your payload?*	[Likert with single selection per year]: <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Not possible to launch</td> <td style="text-align: center;">Could be possible but not ideal</td> <td style="text-align: center;">Possible to launch</td> </tr> </table> 2028 2029 2030	Not possible to launch	Could be possible but not ideal	Possible to launch
Not possible to launch	Could be possible but not ideal	Possible to launch		
If possible, please provide a ROM cost for the development of your payload to reach TRL 7 or 8 from its current TRL	This ROM cost should assume that no IOD flight opportunity is made available by UKSA / UK Government. Please include any further assumptions made.			
Please provide information on any UKSA or wider UK Government funding you have received to develop this payload*	Please provide information on previous UKSA or wider government funding you have received to develop this technology.			
Do you have any more ISAM payloads to provide information on?	[Choice question]: <ul style="list-style-type: none"> <li>• Yes → *Moves on to section 2. Payload Information (for information to be provided on the next payload)*</li> <li>• No → *Moves on to section 3. Potential Impact*</li> </ul>			

3. Potential Impact	Guidance
How likely is it that a successful IOD of your ISAM payload(s) would attract new investment into your organisation?*	[Net Promotor Score question]: <ul style="list-style-type: none"> <li>• 0: Not likely at all</li> <li>• 1</li> <li>• 2</li> <li>• 3</li> <li>• 4</li> <li>• 5</li> <li>• 6</li> <li>• 7</li> <li>• 8</li> <li>• 9</li> <li>• 10: Extremely likely</li> </ul>

How might an IOD help unlock opportunities for your company in the future?	<i>In what ways might an IOD help unlock opportunities for your company moving forward?</i>
If the opportunity to fly your ISAM payload(s) on an IOD mission came about, approximately how many new roles could this create in your organisation?	<i>Please include any assumptions made</i>
Anything else?	<i>Please provide any further information or final comments that you wish to make</i>

## RFI Participation Process

- **The deadline for responses is 23:59 GMT on Monday 08 December 2025.**
- **Submissions should be completed via Microsoft Forms** using the following survey link: [Request for Information: In-Orbit Servicing, Assembly & Manufacturing \(ISAM\) Payloads](#)
- Please provide answers in each section of the RFI survey. This includes indications of where answers provided are actual or anticipated or where the information requested is unknown (for example subject to ongoing development).
- The RFI survey provides the opportunity to submit information on multiple ISAM payloads, up to a total of five.
- Microsoft Forms provides the opportunity for the participant to receive an email copy of their response. This is asked at the end of the RFI survey.
- If you have any questions/queries about the RFI participation process, please contact [sustainability@ukspaceagency.gov.uk](mailto:sustainability@ukspaceagency.gov.uk).

## Any other information

The final question within the survey provides the opportunity to include any other information deemed relevant to your response.

## Privacy Notice

In participating in this Request for Information (RFI) run by the UK Space Agency, you have provided information about yourself ('personal data'). We (the UK Space Agency) are the 'data controller' for this information, which means we decide how to use it and are responsible for looking after it. This notice sets out how we will process your personal data, and your rights. It is made under Article 13 of the UK General Data Protection Regulation (UK GDPR).

### The type of personal information we collect

We will collect and process the following personal data:

Personal identifiers: Names and contact details (email address and telephone number) of employees involved in preparing and submitting responses to the Request for Information.

Your personal data will not be subject to automated decision-making or profiling.

### How we will use your personal data

We are processing your personal data for the purposes of the Request for Information (RFI) described within this RFI invitation. Your personal data will be used in circumstances where we need to seek clarification on any contents of your RFI response.

We will only use your data for the purposes for which we collected it, unless we reasonably consider that we need to use it for another related reason and that reason is compatible with the original purpose. If we need to use your data for an unrelated purpose, we will seek your consent separately to use it for that new purpose.

The lawful basis we rely on for processing your personal data is your consent under article 6(1)(a) of the UK GDPR.

By submitting a response to this RFI survey, you are consenting to your personal data being collected and processed as per this Privacy Notice. You may withdraw your consent at any time by contacting [sustainability@ukspaceagency.gov.uk](mailto:sustainability@ukspaceagency.gov.uk) or the [UK Space Agency Data Protection Manager by email](#).

### Who has access to your data

Access to your personal data will only be provided to staff within the UK Space Agency who need to view it as part of their work in carrying out the purposes described above.

Your personal data may be shared by us with other Government Departments or public authorities where necessary as part of the RFI exercise.

### Retaining your data

Personal data collected for the purpose of providing a point-of-contact when responding to this RFI will be destroyed within three months of the RFI survey closing date. This is to facilitate any

clarifications required by the UK Space Agency on the contents of the RFI response within this period.

## Where we store and use your data

Your data will be processed in the UK within secure UK government systems which use the Government Microsoft 365 environment and are hosted in UK-based data centres. As your personal data will be stored on our IT infrastructure it will be shared with our data processors Microsoft and may be transferred and stored securely outside the UK. Where that is the case it will be subject to equivalent legal protection through an adequacy decision, the use of Standard Contractual Clauses or a UK International Data Transfer Agreement. We will not make additional copies of personal data to store outside of this environment, and access will be limited to staff actively involved in the RFI and potential In-Orbit Demonstration programme.

## Your data protection rights

You have the right to request information about how your personal data are processed, and to request a copy of that personal data.

You have the right to request that any inaccuracies in your personal data are rectified without delay.

You have the right to request that any incomplete personal data are completed, including by means of a supplementary statement.

You have the right to request that your personal data are erased if there is no longer a justification for them to be processed.

You have the right in certain circumstances (for example, where accuracy is contested) to request that the processing of your personal data is restricted.

You have the right to object to the processing of your personal data where it is processed for direct marketing purposes.

You have the right to withdraw consent to the processing of your personal data at any time, using the contact details below or by contacting [sustainability@ukspaceagency.gov.uk](mailto:sustainability@ukspaceagency.gov.uk).

You have the right to object to the processing of your personal data.

To exercise your rights please contact the Data Protection Officer using the contact details below.

## How to contact us

If you have any questions or concerns about our use of your personal information, you can contact us in the first instance at:

UK Space Agency Data Protection Manager

Email: [gdpr@ukspaceagency.gov.uk](mailto:gdpr@ukspaceagency.gov.uk)

If you are unhappy with the way we have handled your personal data or complaint, please write to the department's Data Protection Officer using the contact details below.

DSIT Data Protection Team  
Department for Science, Innovation and Technology  
22-26 Whitehall, London, SW1A 2EG

Email: [dataprotection@dsit.gov.uk](mailto:dataprotection@dsit.gov.uk)

If you consider that your personal data has been misused or mishandled, you may also make a complaint to the Information Commissioner's Office (ICO), who is a UK independent regulator. The Information Commissioner can be contacted at:

Information Commissioner's Office  
Wycliffe House  
Water Lane  
Wilmslow, Cheshire  
SK9 5AF

[More information can be found on the ICO website.](#)

Any complaint to the Information Commissioner is without prejudice to your right to seek redress through the courts.

## Updates to this notice

If this privacy notice changes in any way, we will issue a revised notice. Please avoid retaining local or offline copies of this notice in case changes are made. A version history will be maintained within the UK Space Agency Records Management system for audit and accountability.

If these changes affect how your personal data is processed, we will take reasonable steps to let you know.

END