

Commissioning Letter

[REDACTED]

Tuesday, 23rd June 2020

Dear Sir/ Madam,

**BIS Research and Evaluation Framework Agreement – Lot 1
Space Skills Survey
CR20020**

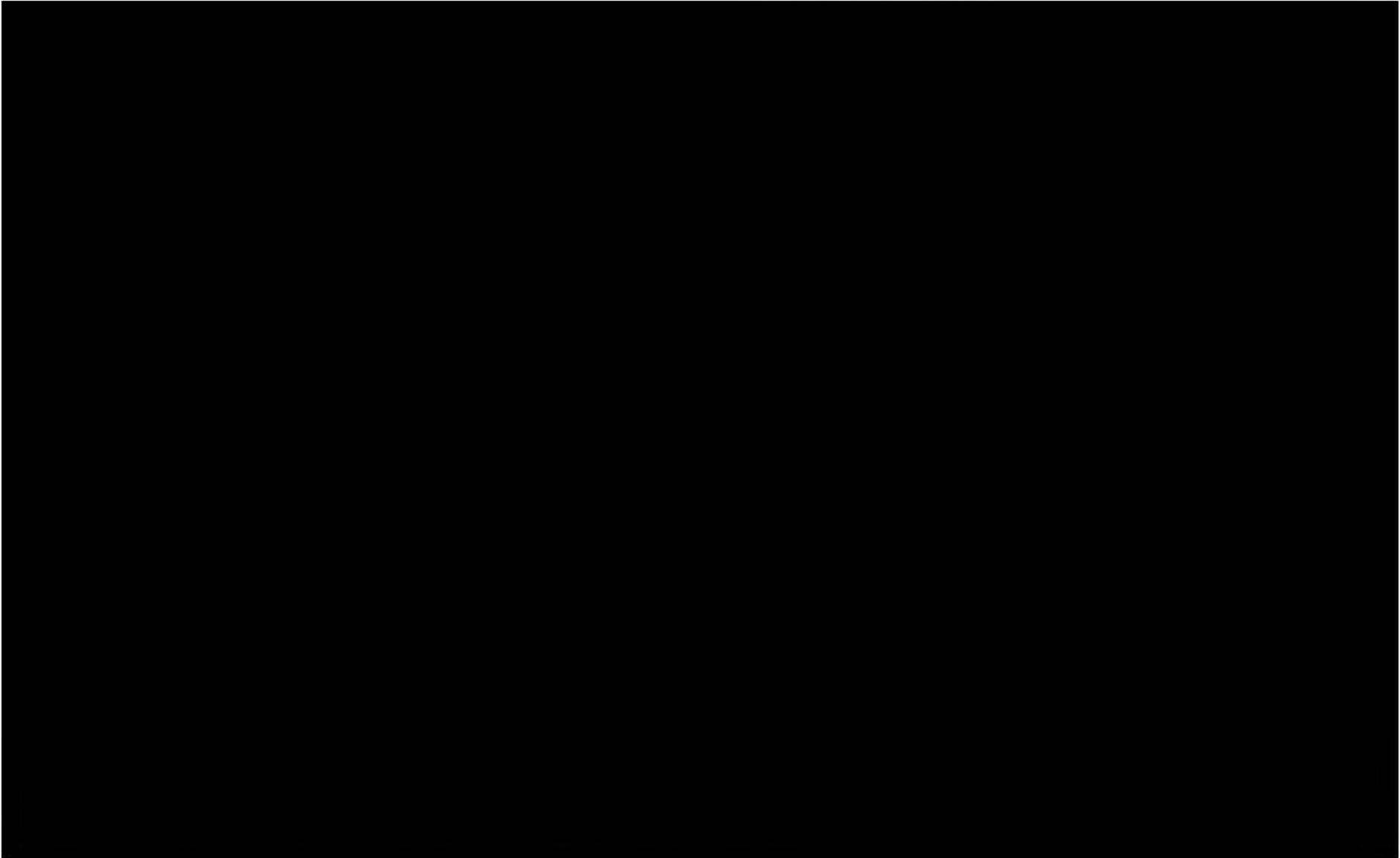
Thank you for your response to the Specification for the above commission by UK Space Agency (UKSA) (the Customer) through the BIS Research and Evaluation Framework dated 2 January 2016 between (1) Secretary of State for Business, Innovation and Skills; and (2) BMG Research (the Framework Agreement).

Annexes: A. Specification for Space Skills Survey
 B. Tender Response dated Tuesday, 31st March 2020

UK Space Agency (UKSA) accepts your Tender (Annex B), submitted in response to our Specification (Annex A).

The Call-Off Terms and Conditions for this Contract are those set out in Schedule 5 to the Framework.

The agreed total charges for this assignment are **£49,100.00** exclusive of VAT which should be added at the prevailing rate. Invoice schedule to be agreed at inception meeting.



All invoices should be sent to should be sent to [REDACTED] or [REDACTED]
[REDACTED]

You are reminded that any Customer Intellectual Property Rights provided in order to perform the Services will remain the property of the Customer. The following deliverables have been agreed:

The Services Commencement Date is Wednesday, 24th June 2020

The Completion date is Thursday, 8th April 2021

The Contract may be terminated for convenience by giving 30 days' notice in accordance with clause 38 of the Call-off Terms and Conditions.

Your invoice(s) for this work must include the following information:

Commission number: CR20020

[REDACTED]
[REDACTED]

Until the date of publication, findings from all Project outputs shall be treated as confidential. Findings shall not be released to the press or disseminated in any way or at any time prior to publication without approval of the Department.

This clause applies at all times prior to publication of the final report. Where the Contractor wishes to issue a Press Notice or other publicity material containing findings from the Project, notification of plans, including timing and drafts of planned releases shall be submitted by the Contractor to the Project Manager at least one week before the intended date of release and before any agreement is made with press or other external audiences, to allow the Department time to comment on factual accuracy. All Press Notices released by the Department or the Contractor shall state the full title of the research report, and include a hyperlink to the Department's research web pages, and any other web pages as relevant, to access the publication/s.

This clause applies at all times prior to publication of the final report and within one month from the date of publication. Where the Contractor wishes to present findings from the Project in the public domain, for example at conferences, seminars, or in journal articles, the Contractor shall notify the Project Manager before any agreement is made with external audiences, to allow the Department time to consider the request. The Contractor shall only present findings that will already be in the public domain at the time of presentation, unless otherwise agreed with the Department.

Congratulations on your success in being selected to undertake this Commission.

Yours sincerely

[REDACTED]

UK Shared Business Services Ltd

For and on behalf of UK Space Agency

OFFICIAL-SENSITIVE (COMMERCIAL)

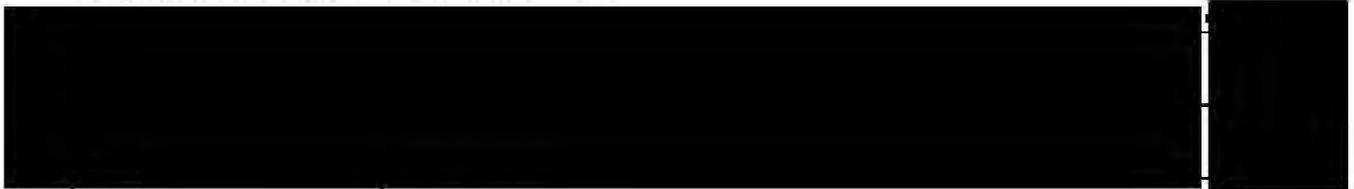
BY SIGNING AND RETURNING THIS COMMISSIONING LETTER THE SERVICE PROVIDER AGREES to enter a legally binding contract with the Customer to provide to the Customer the Services specified in this Commissioning Letter and Annexes incorporating the rights and obligations in the Call-off Terms and Conditions set out in the Framework Agreement.

UK Space Agency



Date	26/06/2020
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Signed on behalf of BMG Research Ltd



Date	24/06/2020
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Annex A - Specification for Space Skills Survey

1. Background

Since 2013, the UK Space Agency has been building a picture of the skills required across the UK Space Industry, surveying organisations in the UK that supply or make use of the space sector. The UK Space Agency now wishes to extend and formalise this activity. The survey will be used to:

- establish the industry's current and future skills and training requirements;
- establish the industry's future workforce requirements;
- relate these findings to the needs of specific sub (specialist) sectors
- inform academia, educators and government;
- inform the development of new training opportunities and funding calls;
- add to the UKSA's evidence base
- input into the formulation of UK space policy and the potential development of a National Space Skills Institute;
- track progress towards the policy objectives, such as those set out in the Space Innovation and Growth Strategy 2014-30.

It is anticipated that this research will take place on a biennial basis.

The space sector can be tricky to define, and much attention has been given to questions of taxonomy over the years. As with previous surveys, the question of where to draw the boundary will be an important one for this project, and we will look to go beyond a narrow 'upstream' and 'downstream' definition. We would invite bidders to familiarise themselves with previous research on this topic, including:

- the [Case for Space 2015 2014 Size & Health](#) (which builds on the survey)
- OECD's [Handbook on measuring the space economy](#)
- OECD's [Space Economy at a Glance 2014](#) (NB we may be able to share the upcoming new version of this with the successful contractor, but cannot guarantee)
- Eomag's [Taxonomy for Earth Observation services market](#)

This survey should ensure that the definitions used are coherent with the 2018 Size and Health survey so that outcomes can be compared.

We invite potential bidders to note that knowledge of the UK space industry is essential for this project.

2. Aims and Objectives of the Project

We wish to commission a survey which will evaluate the current and future skills and recruitment landscape for, and across the breadth of the space sector. It is expected that this will build a picture of the skills and qualification requirements, deficits present in different parts of the sector, and of current and planned training provision. This survey should provide us with a new wave of data covering the calendar year 2019 as a baseline and taking a 2-5 year and 10-year forward look. (Additional work may be suggested as a separate package to provide foresighting information beyond this timescale).

New, consistent data will provide the evidence to inform policy design and to develop new initiatives which will enable us to build the workforce the sector needs to support future growth.

We attach the survey questions used in the last round of this research in annex 1. These are not intended to be prescriptive, but to provide a framework which can be expanded or adapted. We expect the successful bidder to be able to synthesise the survey results into a report that provides information and comments on (at a minimum):

- Trends in current and future skills requirements;
- How these vary across sub-sectors and specialist sub-sectors (e.g. Earth Observation, Position Navigation and Timing, communications) and at different levels of seniority;
- Consideration of the training needed, and how it could be delivered (e.g. if a generic Graduate Training Programme (GTP) were to be supported for SME staff, what might the curriculum look like?);
- Recruitment issues and how to mitigate them;

We are also interested in the regional breakdown of this information (e.g. the ability to drill down to county, local enterprise partnership and other economic development agency levels), and in analysis at the sub-sectoral level (e.g. manufacturing, operations, applications, ancillary services). Again, we are keen to ensure the ability to spot trends at these levels.

The population for the survey will be all companies in the space industry. As noted above, this raises definitional issues and while there has been progress in reaching a consensus on how to define the sector through the work of the OECD, ESA and national space agencies, a firm definition has not yet been reached. For many companies in the upstream and downstream space industries it is more clear-cut, though in the so-called 'wider space economy' it is less obvious which companies are in or out. Our working definition is

'companies for whom, if satellites are turned off, their business model is severely disrupted even after an appropriate adjustment time has passed'

However, size and health 2016 offered an improved approach to identification and segmentation, by providing a multi-tiered segmentation framework, consisting of the following levels;

- Space Manufacturing (SM)
- Space Operations (SO)
- Space Applications (SA)
- Ancillary services (AS)

In turn these categories can be combined to create the following;

- Space Industry; combining SM + SO + AS + SA
- Space economy; combining space industry + users + technology / innovation adopters.

This then maps onto the upstream / downstream, maintaining consistency but providing more depth. We expect that this work will cover the full range of organisations across these segments

The geographical scope for this project is Great Britain and Northern Ireland.

One particularly important consideration is the survey response rate. This is recognised as a challenge, with implications for the overall robustness of the outputs from this work.

We would invite bidders to comment on how they will work to ensure that it is as high as possible for this survey

3. Suggested Methodology

Suggested Methodology (main methodology)	Survey – plus interviews with individuals	
If applicable:		Insert numbers:
Total number of Interviews (survey) - 150		Survey population: 1,000+
Total number of Interviews (qualitative) – 20		Open to inclusion of additional qualitative interviews
Project completion date	A draft report in July, 2020	

The successful bidder will survey firms in the UK space industry. Historically this has been delivered as an online survey with individual interviews, but we are open to alternate approaches (e.g. telephone surveys), though bidders should highlight the relative benefits / drawbacks of this in terms of things like response rate, cost, and data quality and analytical requirements.

Further desk-based research is likely to be required to identify companies in the wider space economy where (for example) they may not be members of a space trade association. As a relatively small (but economically important) sector, one advantage that we have for this survey is a good network of contacts throughout the sector. We will use these to help identify companies and to promote the survey and will provide contact details to the successful contractor to the extent possible. Nevertheless, industry knowledge within the sector will be an advantage to bidders, as this will help to maximise response rate.

Another important consideration is who in an organisation is best placed to provide the data we require. Naturally, the best contacts within each company will vary – it could be an owner, an HR manager or another member of staff, depending on the size or 'type' of company.

Questions to be covered are set out in the background, aims and objectives sections above. We invite bidders to comment on potential approaches to these questions (building on the questions suggested below)

Bidders should also comment on specific methodological issues in their bids.

Follow-ups will likely be necessary to boost responses rates and potentially to verify information.

Once responses have been collated, the contractor will summarise these into a report highlighting trends, training needs and, where possible, implications for the sector and policymakers.

This is a suggested methodology and we would welcome bidders' alternative suggestions providing that they also meet the project aims and objectives. Bidders should also justify why they have suggested an alternative approach.

4. Deliverables

All contractors are to ensure the following are included in the costings for this project:

- Questionnaire development
- Provision of underlying dataset of survey results and secondary analysis – to be owned by the UK Space Agency following conclusion of the project
- Weekly updates on emerging findings and project progress
- Draft report allowing reasonable time for UKSA to comment
- Quality assured final reports including requested subnational / sub sector / specialist reports (for internal Agency use only)
- Summary poster / infographic
- Slide pack summary including presentation of results

Publication

The final report for this research / evaluation project must be formatted according to UK Space Agency publication guidelines, adhering to UKSA/BEIS accessibility requirements for all publications on GOV.UK. The publication template will be provided by the project manager. Please ensure you note the following in terms of accessibility:

Checklist for Word accessibility

Word documents supplied to BEIS will be assessed for accessibility upon receipt. Documents which do not meet one or more of the following checkpoints will be returned to you for re-working at your own cost.

- document reads logically when reflowed or rendered by text-to-speech software
- language is set to English (in File > Properties > Advanced)
- structural elements of document are properly tagged (headings, titles, lists etc)
- all images/figures have either alternative text or an appropriate caption
- tables are correctly tagged to represent the table structure
- text is left aligned, not justified
- document avoids excessive use of capitalised, underlined or italicised text
- hyperlinks are spelt out (e.g. in a footnote or endnote)
- Datasets to support those to be published in the final report must be provided in an accessible format (CVS, Excel) on submission of the report.

Annex B – Tender Response

Approach/ Methodology

In order to evaluate the current and future skills and the recruitment landscape for, and across the breadth of the space sector we recommend that a multi-faceted approach is taken involving the following key stages:

- Project inception & design - involving detailed discussions with the client, review of background information/previous research and a desk research exercise to design the sampling frame and survey questionnaire.
- Quantitative survey – with a telephone survey as the first/primary approach, supported by an online survey to increase accessibility & response rates.
- Qualitative depths by telephone
- Analysis and reporting

Each of these stages will now be discussed in turn, along with the risks and challenges that may be faced. Space does not allow for a full risk assessment, which we would normally produce at this point, but we would be happy to do this on commissioning:

Project inception & design

This stage would usually begin with a face to face **inception meeting** with the BMG project team and the client. However, under the current circumstances we recommend that this be undertaken via video conference as our full research team are currently working remotely/from home. The purpose of the meeting would be to ensure there is a shared understanding of the aims, objectives and scope of the project, review the key background information available and confirm the approach. Project management arrangements will be agreed between the key personnel, as well as the risks and challenges, to ensure that appropriate, effective and clear mitigation strategies are in place from the outset. It is anticipated that this meeting will include discussion/review of:

- Previous research, and in particular previous skills surveys – in order to make comparisons with the previous skills survey it will be particularly helpful to understand how the sample was designed, to inform/confirm our approach this time.
- Design and timings of advance notice communications – to help boost response rates and ensure we cover the full breadth of the space sector, we recommend advance communications of the survey are sent out online/via social media to inform relevant organisations of the survey and allow them to register their interest in taking part.
- Review of other methods to generate sample/research contacts – we will also review other potential sources of sample generation, including trade association websites, relevant SIC codes identified and the client's own contacts.
- Details of all the processes in place to ensure the research is delivered to the highest possible standards and all data quality and security measures are adhered to.

Following that meeting, we will produce a **Project Initiation Document** to summarise the key outcomes from the meeting, confirm the agreed approach and any revisions to the original proposal. This document will be of a high importance as it will include milestones for deliverables for the agreed approach, against which we will manage and review progress.

Before the survey fieldwork and depth interviewing begins, we will work closely with the UK Space Agency to design and manage the various steps involved in preparing for fieldwork:

Questionnaire and survey material design

We have reviewed the questionnaire from the previous skills survey and provided comment on this in the project understanding section of this tender. We understand that the full report from this work will be available to us, if we were commissioned to undertake the survey. We would therefore be glad to conduct a more thorough review of these findings and review the draft questionnaire in detail once this report was available to us. At this stage however we can confirm that **BMG will work with the UK Space Agency to ensure the questionnaire fully achieves its objectives**, by:

- Ensuring that it is suitable for completion by both telephone and online;
- Includes questions to identify current and anticipated skills and qualification requirements and deficits, as well as current and planned training provision and recruitment needs - for the 2020 baseline, the next 2-5 years, and the next 10 years where possible, at a total sector level, as well as on a sub-sector and regional basis;
- Ensuring that in the screening section it is clear who within the business we need to conduct the survey with i.e. the most senior person available to comment on skills issues, recruitment and training across the business. It is recognised that the individual will differ according to the size and nature of the organisation. In smaller businesses it may be the owner/MD, whereas in larger organisations it could be a HR Director.
- Adhering to all relevant legislation and guidance, for example in terms of GDPR and MRS Code of Conduct.
- To ensure questions are fully understood by respondents and achieve the project objectives we would also conduct **up to 5 cognitive interviews** to test/confirm.

An iterative process would take place between the UK Space Agency and BMG where drafts of the questionnaire are reviewed and amended until the client was fully satisfied that the final version meets all its objectives. **The survey would be up to 25 minutes in length and include up to 5 open questions** to allow respondents to expand on thoughts/issues. BMG would also draft a **reassurance letter** to be emailed out during the telephone interview to any respondents wanting further reassurance as to the purpose and validity of the research.

We would also work with the client to help **prepare advance communications/notice of the survey** which could be circulated online/via social media. The exact contents and nature of this would be discussed at the inception stage, as well as the channels available for distributing this information, but we believe that in order to make the survey as inclusive, comprehensive and accessible as possible to employers, advance notice communications should be circulated to explain:

- Why the research is taking place, and what the information will be used for;
- When and how the survey is taking place;
- How employers can register their interest in participating.

The advance communications could have a link to a secure site hosted by BMG Research where employers interested in participating in the survey can register their details, to help supplement the sample frame.

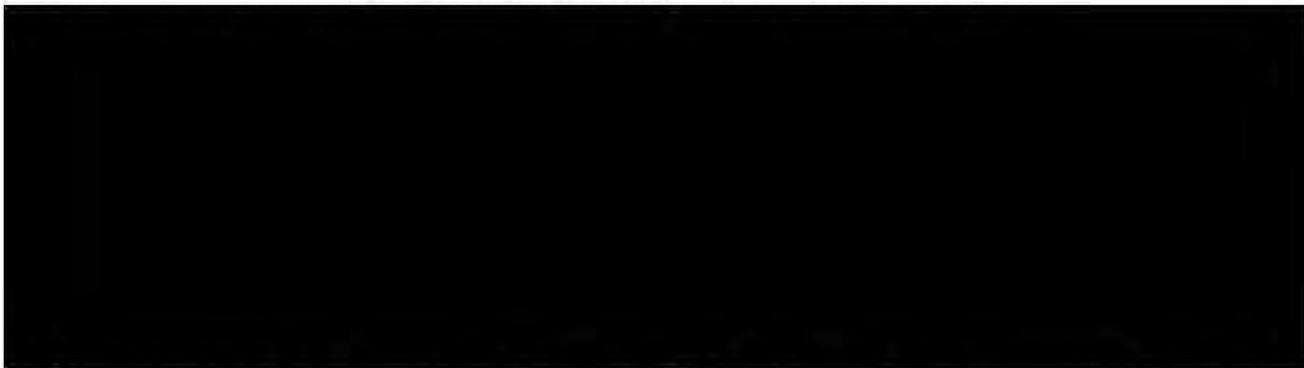
Sample plan & quotas

We recognise that the scope of the survey is to represent the 1000+ organisations from the space sector across GB and Northern Ireland.

As we have described in the later section of this proposal a sample frame will be generated via a combination of desk research, utilisation of the client's contacts, the advance communications described above, by ordering sample from a business database such as Experian and asking survey respondents to refer us to businesses they are connected to or types of businesses they work with so that we can research these further and consider for inclusion. These sources would be used to establish a sampling frame and design that would be as **representative of the business universe as possible, in terms of size, sector and location, but that will also allow for robust sub-group analysis at these levels.**

We are aware that the UK space sector can be split into 4 broad sub-sectors: space manufacturing (including launchers to place spacecraft in orbit); satellite operators; satellite applications and services; and ancillary services. Satellite applications and services account for the majority of the sector's turnover (around three quarters), followed by space operations, space manufacturing and ancillary services. The 2016 Size and Health survey of the space sector, found that 29% of the 171 companies covered were micro enterprises (<10 employees), 16% small (10-49), 26% medium (50-249) and 29% large (250+), and that in terms of employment, the 38,552 employees (in 2014/15) were distributed as follows: Manufacturing 18%; Operations 8%; Applications 69%; Ancillary services 5%. Our knowledge and initial research also suggest that businesses from the sector are concentrated particularly in London and the South East.

Our initial desk research has found the following contacts would be available:



We understand that screening within these SIC codes will be necessary to filter out businesses that have no connection to the space sector.

At this stage based on our knowledge of the sector, the availability of contacts and the methods we have in place to maximise response rates we are **confident that we could achieve a minimum sample of 150 interviews** with representatives from the sector. We would aim to exhaust the sample as much as possible using the methods described so that the achieved sample was closer to the **171 achieved previously**, where possible.

Once compiled using all the sources mentioned we would profile the database. Together with the known population estimates, the profile of the sample achieved in the previous survey and the priorities of the client we would then finalise the sample design and agree the quotas to be achieved within the overall target of 150+, with the aim of ensuring analysis was possible of/between the 4 key sub-sectors and to include analysis/comparisons at a regional level. We may for example decide to over-sample smaller sub-sectors where possible to allow for more robust analysis, and then apply weights to ensure the overall/total sample was representative of the sector.

Management of the available sample will be a critical factor in the conduct of this survey. Once in field the sample would be carefully monitored against the quota targets and the client informed of any issues/difficulties at the earliest possible stage, so that corrective action can be taken.

Survey set up and testing

As we have stated in our understanding, we believe that in order to better control the profile of the sample achieved, engage more effectively with respondents, ensure the correct individual within organisations is reached and reduce response bias we believe that all first approaches for the survey should be by telephone. However, to increase accessibility of the survey and give organisations flexibility over when and how they complete the survey we will also offer all respondents the option of completing the survey online.

Once the survey questionnaire is signed off by the UK Space Agency this will be scripted for both telephone (CATI) interviewing and online completion by our data services manager. The Conformat technology we use is fully compatible in both formats so that consistency is achieved. Online survey completions would flag key fields from the database so that we can carefully monitor completions against the quota targets.

As well as being checked by the data services team both scripts would also be thoroughly tested by the researchers working on the project before being launched for pilot.

Interviewer briefing and pilot

The project would commence with a **half-day briefing session of interviewers**, this would be led by the project director and we would also welcome the attendance of the UK Space Agency (by video conference if necessary). The briefing would cover:

- A detailed discussion of project objectives and its background, stressing to interviewers the significance of the survey and some of the issues/challenges that they may face in engaging with employers on this particular subject matter
- A review of the questionnaire, and issues regarding data capture for questions
- Explanation of sampling methodology, including sample design and quotas, as well as a clear explanation of who within each business we need to target for the survey
- Timetable for the project
- Detailed review of quality control procedures

The briefing would be delivered via a PowerPoint presentation (which can be shared to those working remotely) where the CATI script can be loaded up so that interviewers can begin to familiarise themselves with the survey as it will appear on their screens. Interviewers will use role-play to practice conducting live interviews.

All interviewers will therefore feel fully prepared before making any calls and be able to deal with any queries in a confident and reassuring manner.

Prior to the full stage of fieldwork, we would first conduct a **pilot stage of 15 interviews** as a final test of the survey questions, to ensure respondents fully understand what is being asked of them. Data and feedback from the pilot would be reviewed and any necessary amendments made, before the full period of fieldwork commences.

Conducting Telephone Surveys among businesses at BMG

BMG has state of the art contact centres in Birmingham and Glasgow, with 150+ fully operational CATI units. In response to the Coronavirus outbreak our call centre operatives are currently working remotely/from home where possible, with 100+ interviewers currently active. We are therefore, even in these challenging times, **able to fully resource the interviewing required with our trained business to business interviewers, with our call centre managers keeping a careful eye on quality via remotely listening into calls.**

We employ Confrimit technology in our contact centres, which are open as standard from 8.00am to 8.30 pm, Monday to Friday, and 10.00am to 4.00pm on Saturday and Sunday. However, we tailor our time period for 'first approaches' as appropriate to the sample (and never outside of MRS Code of Conduct regulations).

BMG operates a remote dialing system which enables nominated staff from client organisations to dial-in at allotted times in order to listen in to calls live and in process. We also have 100% call recording, which means that all interviews are recorded.

Our systems are configured to ensure that we are fully compliant with Ofcom's recent and forthcoming regulations; our dialing algorithms and call back procedures are fully compliant with recent and upcoming new policies. Examples of this include zero tolerance on abandon calls (as a result of predictive dialing) as well as displaying approved numbers and clearly identifying who we are and why we are calling. If respondents decide to call us back, they will hear a voicemail message giving them a brief overview of the reason for the call, and offering them the means to either opt in to participation, or to opt out. If they require further information, or would like to speak to someone in person, they will be invited to leave a message to this effect, and will be called back accordingly. These processes are seamlessly managed as our survey platform is fully integrated with our dialer and logic passes on calls, stats (key driving values), outcomes and appointments handling.

Interviewers will be drawn from our experienced call centre teams, with **significant experience of business interviewing. Many of the interviewers are likely to have worked on previous skills surveys such as ESS.**

Businesses, particularly larger employers, are constantly being approached for research purposes. By engaging researchers with direct experience of business-to-business research, and a sound knowledge of the common terms and descriptions used, related issues raised during the interview by the respondent can be dealt with in a confident manner. By employing skilled and experienced telephone researchers, emphasis is placed at the outset on ensuring the full co-operation of the target respondent.

A business must feel that:

- The survey is worthwhile
- As a business they can benefit
- Completing the survey is a good use of their time

Competent, experienced and fully trained telephone researchers can instill in businesses a sense of value for the research, thereby encouraging full participation as well as honest and open dialogue. BMG's research and operational teams are fully trained to overcome barriers, ensuring an accurate and complete response from senior business leaders.

Maximising response

Throughout fieldwork BMG will undertake a number of steps to maximise quality and response to the survey, these will include:

- Most interviews will be made via prior appointment, with an initial call being made to secure the contact details of target respondents and appointments set to call back. At this stage respondents would also be offered the option of completing the survey online.
- Those invited to complete the survey online will also be sent reminder emails.
- Subject to the client's agreement we would also suggest incentivising respondents by offering a short 4-page summary of the research findings, written by BMG & approved by the client, ahead of the full publication of the report, as a thank you for their time.
- Call outcomes will be monitored on a regular basis using the call logging systems installed in our call centre. This will allow us to highlight any issues over refusals/non-response early in the process and take corrective action. BMG's call management software automatically schedules all call backs and appointments, ensuring we maximise the opportunity of making contact, and allows interviewers to leave detailed notes on previous contacts, ensuring later approaches are as seamless as possible. Where respondents indicate they are only available outside core interviewing hours (8am-5pm weekdays) we maintain a small team to pick up these appointments outside these hours.
- Contacts will be called 10 times before being discarded as a non-response. All outcomes are logged to industry standard i.e. successful; refused; no reply; answer machine; ring backs but unsuccessful; ceased trading; wrong number.
- If potential respondents are unsure if BMG Research is a valid research organisation, they will be offered the Market Research Society's free-phone number, to call and check. This number is also given to respondents at the end of each interview.
- Some respondents may require written confirmation of the survey's validity; we will draw up an email for approval which provides further details about the survey and why it's being commissioned, which can be emailed to respondents direct from the CATI station.
- Respondents are also given the direct number of a BMG executive if they wish to find out more about the research and confirm its validity.
- Interviewers will be required to make a declaration at the end of the interview stating their professional conduct and accuracy of the data recorded. This provides a continuous reminder to the call centre teams of the importance of their role in the process.
- To also ensure the study is accessible as possible to all participants, BMG shall offer all respondents options for completing the survey online or by telephone. If required, we can offer on request, paper versions of the questionnaire both in normal and large print. Our CATI and online software also has a facility for conducting surveys in different languages whilst still using the same sample and quota definitions, and questionnaire map. We have a diverse range of interviewers available to conduct the survey in various languages, including Welsh, Punjabi, Urdu, Bengali, Gujarati and Polish.
- We will update the client on at least a weekly basis during fieldwork to keep you fully up to date with progress against the agreed targets.

Qualitative Depths

Following a review of the topline information emerging from the quantitative survey BMG would review with the client the focus/priorities for the depth interviews, in terms of the topics to be covered and types of businesses to prioritise. BMG would draft the topic guide to be reviewed and finalised with the client, as well as the profile of businesses to be interviewed.

20 depths interviews would be conducted over the telephone, by fully trained and experienced members of the BMG research team and are expected to average 45 minutes. In-depth interviews are less prescriptive than survey questionnaires and allow a more free-flowing, discursive exchange to take place. There will be more freedom to go 'off script' and discuss specific issues that may not have been expected. The agreed topic guide can be tailored according to the respondent type to ensure that maximum insight is extracted. BMG are experts in recruiting 'hard to reach' professional audiences. As independent researchers with a strong reputation in public sector research our impartiality will be a considerable benefit.

All interviews will be recorded (where permission is given) for analysis purposes. Responses will be transcribed and entered into a grid format so that the analysis can be conducted in a consistent way, regardless of the variation in the responses provided.

Firstly, the key themes and topics arising from the interviews are identified through the topic guide (which will address the key questions for the research) and an initial review of a selection of transcripts. Each of the key themes and topics are then translated to a column heading in an Excel grid, with each row within the grid representing an individual group/depth. Researchers analyse each transcript individually, by extracting relevant data from the interview and summarising it into the appropriate cell within the grid. Verbatim quotations are included alongside the summaries where possible.

Once all of the feedback is received, researchers review and analyse the information within the final grid: a series of thematic tables of qualitative data representing all of the respondents who had participated in the qualitative research. Researchers read horizontally across the grid to obtain a full understanding of each group's views and experiences, and read vertically down the grid to gain an understanding of the commonality of particular views in relation to each of the themes, as well as any differences between the participant types. Using this approach where particular themes and commonalities emerge between respondents these are included in the report. The views of individual respondents are only included where they have had a very different experience to others to highlight specific instances where things have gone well or not well.

Data processing, analysis and reporting

We have carefully reviewed and considered the deliverables and reporting from the project and are happy that we can fully fulfil all of these as specified:

- Provision of underlying dataset of survey results and secondary analysis – to be owned by the UK Space Agency following conclusion of the project
- Weekly updates on emerging findings and project progress
- Draft report allowing reasonable time for UKSA to comment
- Quality assured final reports including requested subnational / sub sector / specialist reports (for internal Agency use only)
- Summary poster / infographic
- Slide pack summary including presentation of results

Much of the work that we conduct as a company is for public sector organisations and as a result a large proportion of the reports that we produce is published. We are **well aware of the need for reports to stand up to public scrutiny and to be written in such a way that a wide variety of audiences are able to understand, use and value the data and its analysis.** Survey data and conclusions can also be 'triangulated' with outcome data, data from previous surveys and with the conclusions of other studies where comparison is

statistically and intellectually legitimate. Direct input from our Chief Research Officer will be particularly valuable here, in terms of his experience of working in the space sector and as an accomplished statistician, experienced in advising clients of future market needs and changes.

The report will include an Executive Summary of key findings which would be suitable for dissemination as part of the main report, or as a more concise option for wider circulation. Draft written reports will be produced and presented to you for feedback prior to the production of final reports. A short summary for respondents would also be drafted for your approval.

The agency will also produce a set of cross-tabulations for the survey. The variables (and derived variables), by which the data will be analysed will be agreed with you in advance. The agency does not limit the number of variables by which the data will be cross-tabulated in the data reports, as we recognise that these documents are used as reference tools throughout the life of the survey data. The data report will include full significance testing.

Specifications for data outputs and written reports will be drafted during the fieldwork window and agreed with you prior to undertaking the analysis. A technical report will also be produced, written in clear and simple language and be accessible to the lay reader.

The features of our reporting will include:

- **Core messages:** We pride ourselves on being able to reduce large volumes of complex data to its core messages in a concise and easy-to-read fashion. We also ensure that our reports go beyond simple narrative descriptions of data, and that they incorporate insights and comparative information that puts the results into context.
- **Senior level insight:** Reporting will benefit from the insight and analysis of the programme and account lead prior to delivery.
- **Statistical confidence:** We will undertake statistical significance tests on the data to assess whether any changes are observed between different variables, such as location, business size or sub-sector.
- **Our report will include as standard:**
 - Executive summary
 - Methodology note
 - Key findings and analysis
 - *Visualisations and infographics*
 - Conclusions & recommendations

Staff to deliver

As a full-service agency with significant expertise in skills surveys and the space sector BMG Research is one of the few full-service research agencies with a fully resourced in-house operations department to handle all fieldwork, coding, data processing, reporting and consultative services, meaning no aspect of the project will be sub-contracted.

We have a team of around 70 research executives, managers and directors; all of whom possess unparalleled experience in large scale survey and research among businesses/ employers enabling them to offer consultancy advice in survey and methodological design and provide insight into your findings. Our 150+ seat call centres in Birmingham and Glasgow have specialist business telephone interviewers trained to the Interviewer Quality Control Scheme standards. This in-house resource means that we can respond quickly to

ad hoc requests (allocating additional resource if necessary) and also respond flexibly to unexpected challenges (including the current Coronavirus outbreak) and delays.

BMG Research has been in business for over three decades, and mainly undertakes research and evaluation contracts for departments and agencies of central government, for regional and local authorities across the United Kingdom, and for the voluntary sector. Examples of clients include BEIS, DfE, DWP, DECC, Defra, Home Office, DCLG, HSE, the Welsh Government, Sector Skills Councils, local authorities, further education colleges and universities.

BMG is a leading agency in the UK for business interviewing on behalf of local and national bodies and academia. Since 2012, the agency has been the contractor for the Longitudinal Small Business Survey (LSBS) on behalf of BEIS (the Government's flagship business survey). In the past five years BMG has had over 50 separate commissions from BIS/BEIS and its agencies. The agency has been a fieldwork contractor for the UK Employer Survey in all editions since 2003, completing more than 20,000 telephone interviews on each occasion. Our experience in employer skills surveys includes:

- **Department for Education's Employer Skills Survey (ESS).** BMG Research has been a fieldwork contractor for all editions of the survey in its various forms and names since 2003 (2003, 2004, 2005, 2007, 2009, 2011, 2013 and 2013, 2015, 2017, 2018 and 2019 editions). Around 20,000 interviews were conducted by BMG in 2019, within three Government Office regions. The survey is designed to gather detailed information on UK employers' skill needs and training activity in order to inform government policy decisions. We have delivered this through our in-house CATI call centres and specialist B2B interviewing teams.
- In 2018, a survey of **Cyber Skills for the Institution of Engineering and Technology (IET)** which focused on specific cyber security issues and related skills needs facing engineering, ICT and other technological industries, and the **IET's 2017 skills survey**.
- The last 2 editions of **CITB's Skills and Training Survey (2016, 2018)**, which were large scale telephone surveys amongst 1200 UK businesses in construction and professional services sectors; An evaluation of **Work Readiness for CITB** in 2018 which combined online, CATI and in-depth interviewing;
- **CITB's Workforce Mobility and Skills Survey**, involving nearly 5,000 face to face interviews across the UK in 2015 and 2018;
- In 2018, BMG undertook a major study of training needs in the Further Education sector on behalf of the **Education and Training Foundation**. This included an on-line survey of 2400 staff working in FE colleges and private training companies together with a telephone survey of over 400 institutions and a programme of depth interviews with managers in the sector.

BMG has also successfully delivered many other large-scale employer surveys in recent years, in a range of business sectors, including defence, aerospace and the space sector. Our client's satisfaction with the delivery of these surveys is demonstrated by many of the projects being re-commissioned, for BMG to undertake the surveys again in subsequent years. Examples of such projects include:

- BEIS's flagship Longitudinal UK Small Business Survey 2015-2020, a project involving 15,500 telephone interviews across the UK in 2015, and 11,000 interviews in 2019.
- In 2018 BMG were commissioned by the Single Source Regulations Office (SSRO) to undertake research among stakeholders to gain insight into their relationship with the SSRO and to understand if there are any areas where the SSRO can engage

with them more effectively. SSRO stakeholders represent the Defence sector as a whole and there is some overlap with the aerospace and space sectors. The research consisted of an online survey, followed by in-depth interviews.

- Global Entrepreneurship Monitor (GEM) BMG Research has undertaken the UK and Ireland research every year since 2013. The survey is the world's most authoritative comparative study of entrepreneurial activity in the general adult population.
- Greater Brighton Business Survey (Greater Brighton Economic Board, 2019) – Survey of 1,500 employers across the Greater Brighton City Region. Areas of investigation included economic performance, markets, innovation, skills/training needs, the UK's exit from the EU and views on the local infrastructure.
- Guernsey Brexit Survey (States of Guernsey of Commerce and Employment Department, 2018) – A survey of c400 employers based on the islands of the Bailiwick of Guernsey. The survey aimed to determine the impact of the UK's exit from the EU on the Guernsey economy in order that the States were able to address the concerns of local businesses and provide guidance on what businesses should do to prepare for, and how to respond to, emerging challenges posed by 'Brexit'. The methodology combined telephone and online approaches to businesses in order to maximise response rates.
- Leeds Business Survey (Leeds City Region, 2010, 2015, 2017, 2019 and currently in field for 2020): telephone survey of at least 2000 businesses across the region, with quotas on business size, sector and district, and covering issues including investment, technology, transport, innovation, recruitment, skills and business finance.

BMG is therefore fully cognisant of the most up-to-date survey delivery methods for business surveys.

Quality assurance of all projects undertaken by BMG is driven by strict adherence to our Quality Management System (QMS), which is in turn underpinned by a number of international standards against which we are audited and assessed, including:

- ISO 9001: 2015; The International Standard for Organisational Quality;
- ISO 20252: 2012; The International Standard for Market Research;
- ISO 27001: 2015; The International Standard for Information Security Management;
- IQCS. The Interviewer Quality Control Scheme;
- The Data Protection Act and General Data Protection Regulation;
- The Market Research Society (MRS) Code of Conduct;
- Cyber Essentials Plus certification;
- A Fair Data organisation.

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] expertise in research design, and his skills and experience as an accomplished statistician.

The full team proposed for this study comprises only established members of BMG Research, which should ensure stability throughout the research programme.

However, our large team of researchers together with well-established project and quality management methods, including detailed record keeping and regular team meetings/sharing of information mean that researchers of equal quality/experience would be on hand to step in if required. The full team selected for this project is as follows:



Full CVs are available on request, however details of the core team are summarised briefly below along with the role of each team member:

[Redacted text block]

[Redacted text block]

[Redacted text block]

[Redacted text block]

BEIS, UKCES, DfE, various LEPs, the former LSC, SSCs, local authorities and other central government departments. She has managed a number of projects for the IET (Institution of Engineering and Technology) (2017, 2018 2019) – which have involved exploring specific skills issues facing businesses with engineering and technical personnel, as well as being the project manager for fieldwork/interviewing for ESS for many years.

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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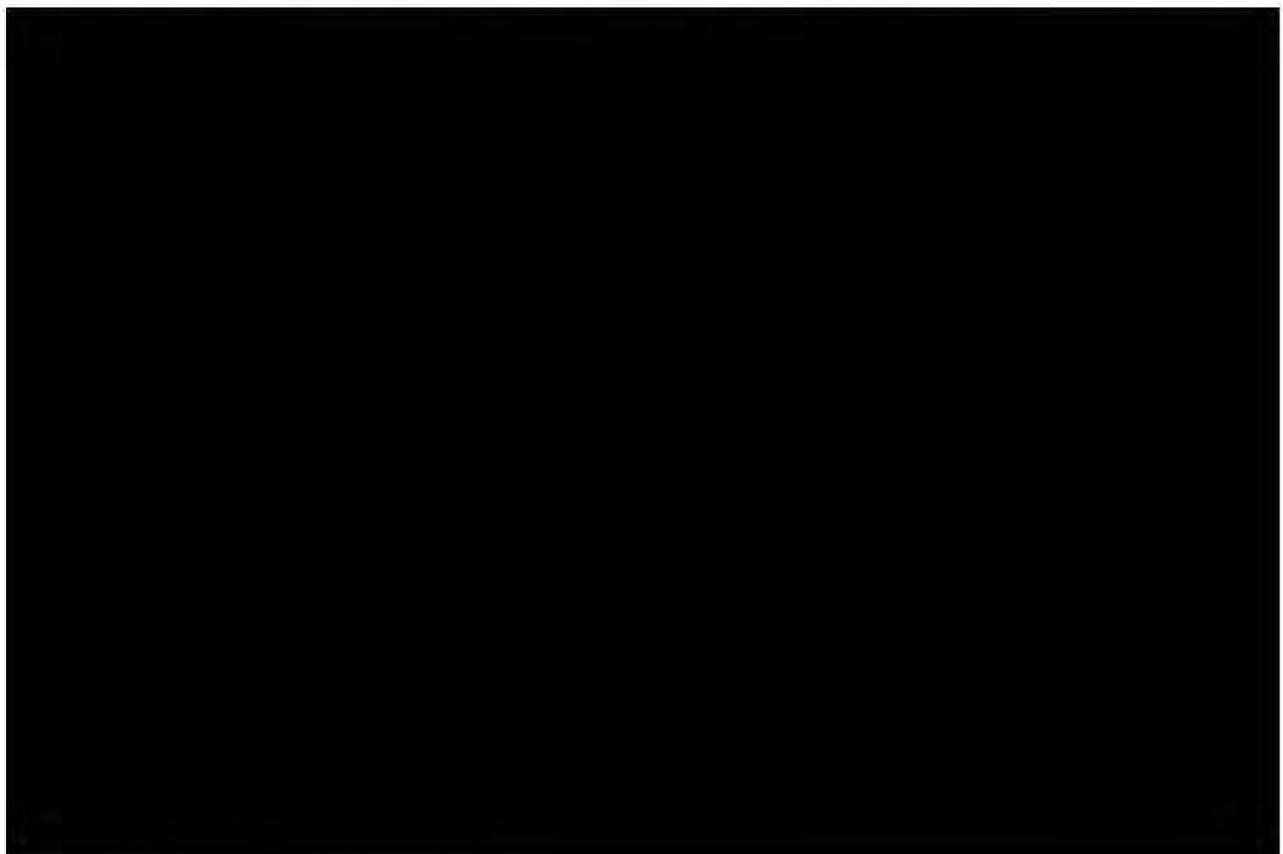
OFFICIAL-SENSITIVE (COMMERCIAL)

resident satisfaction, as well as customer satisfaction in the form of Ofwat's SIM and Replica surveys. He is responsible for adherence to Data Protection Legislation and the Market Research Society Code of Conduct related to confidentiality of information and is fully compliant with Information security procedures (ISO27001) and quality Management System. [REDACTED] also supervises and maintains all work schedules within the database team by coordinating and prioritising projects.

This team would be fully supported by BMG's technical and administrative staff and BMG's 150+ seat call centre. Our team of 100+ call centre interviewers who are currently working remotely due to the Covid-19 crisis, are all being carefully monitored and managed by our operational team including [REDACTED].

We use the latest Conformat software, and our researchers have full support from an experienced team of data service executives, field managers, sampling specialists and coders.

The following timetable summarises the key milestones and deliverables for the project, based on reporting in July. We have built in some contingency to allow for responses to the survey and depth interviews to be lower than normal given the current restrictions imposed by coronavirus and that it is not known exactly how long these will be in place:



Section 3: Project Environment

BMG and the project environment

We believe that BMG is well positioned to deliver this project to the highest quality based on our ability to fully recognise, and to operate within, the study's environment. Particular

aspects of our corporate and individual experience have been itemised in the previous section of this proposal.

However, in summary, our understanding of the project environment is based essentially on: (1) over three decades of experience in delivering economic and labour market surveys on behalf of national government and its many agencies; (2) specifically, of delivering many sector skills surveys (in, for example, automotive, manufacturing technologies, construction, retail, hospitality, and most other major sectors); (3) BMG project management of this study would be led by a senior individual with direct experience of working in the space industry; (4) careful reading of the documents referenced in the ITT and of other relevant literature; (5) our expectation that the project would start with an introductory inception meeting with the Space Agency in which nuances and practicalities of the project would be carefully considered and outstanding issues resolved.

The UK space industry

The UK Space industry has been extensively described (in documentation as above) and there is limited space here to reiterate or even to summarise the information available. We therefore simply note some of its key features:

- The industry can be considered as having 'upstream' and 'downstream' components further structured across space manufacturing, space operations, space applications, and ancillary support services segments. This industry operates in direct consumer, commercial, and government (including military) markets – with revenue and employment weighted strongly to the 'downstream' applications of satellite broadcasting and provision of associated services and equipment.
- The core space industry in the UK has been variously measured but broad estimates are that it comprises around 1000 + organisations employing around 45,000 people across 1500 sites and having an annual income (comprising commercial revenue and grants from several UK and EU agencies) of c. 15 billion pounds. The industry's annual growth trajectory both in the UK and internationally has been upwards for at least two decades.
- Beyond this core space industry, a large and growing proportion of the UK and global economies is supported by satellite-based technologies – particularly GPS, meteorological, telecoms, and earth observation technologies.

¹ Some documents briefly reviewed in preparation for the bid include: *Size & Health of the UK Space Industry 2018*, A Report to the UK Space Agency, Summary Report, London Economics for the UK Space Agency, January, 2019 (Updated estimation of the scope, value, and potential of the UK industry); *The Size & Health of the UK Space Industry*, London Economics for the UK Space Agency, Oct. 2014 (Estimation of the scope, value, and potential of the UK industry); *Spillovers in the space sector*, A research report for the UK Space Agency, London Economics for the UK Space Agency, 2018 (Estimate of benefits to the wider economy of space industry R&D); *Satellites and space programmes if there's no Brexit deal*, UK Government guidance, March 2019 (Simple summary of relations between UK space industry and major EU space support programmes – Galileo, Copernicus, etc – and effect of Brexit on those relations); *Prosperity from Space, A Partnership Strategy for the UK*, Space Growth Partnership, 2015, (Recommendation to the UK Government to build its support strategies on four key areas of the space industry: Earth information services, In-space robotics, Connectivity services, Low cost access to space); *OECD Handbook on Measuring the Space Economy*, OECD, March, 2012 (Issues in, and approaches and metrics applied to, the quantification of national space activities); *The Space Economy at a Glance 2014*, OECD, Oct. 2014 (A statistical overview of the global space sector and its contributions to economic activity in 40 countries); *Taxonomy for Earth Observation services market*, The European Association of Remote Sensing Companies (EARSC), April 20, 2012 (A (Classification of EO applications, products, and services); *Space Industry Act 2018*, UK Government, 2018 (Establishes UK regulatory framework for activities involved in space flight)

Beyond this brief outline of the industry context, we interpret the 'project environment' as essentially comprising the Space Agency's requirement for a careful and reliable study which will deliver a sound base of information on industry skill needs and on current industry responses to those needs. Critically, it will also identify opportunities for the industry, in collaboration with external actors [including the UK government (for example through its apprenticeship programme), the UK Space Agency, and training providers (including FE Colleges, HEIs, and private providers) to increase, even optimise, skills supply.

We therefore devote the remainder of this section to discussion of key challenges raised by the study and its aims and objectives. Some of these have already been considered in more detail in our 'method' section but others are also raised there. Our key point is that BMG's experience and capability, as summarised above and as exemplified in other sections of our proposal, would, if we were commissioned, allow all of these challenges to be recognised and to be met with effective research and analysis solutions. We emphasize again that we would look forward to contributing fully to an inception meeting with the Agency to ensure that our proposed solutions were both practicable and in full accordance with Agency's expectations in respect of study processes and outcomes.

Defining the industry and identifying a sample frame

As in the ITT and much industry literature, we recognise the basic challenge of defining which businesses are part of the industry and which are not. At the 'upstream' end, there are, for example, precision engineers or software developers with more general markets which supply *some* of their output into the industry but which are not 'space specialists'; and at the 'downstream' end, customers (such as major food producers or retailers) who buy satellite-dependent weather forecasts but are clearly not part of the industry. The important issue will essentially be to survey those one thousand plus organisations which are *core* to the Space Agency's sphere of interest and influence rather than those which, as in these examples, are peripheral.

We anticipate that we will achieve, this: firstly, by identifying a 'whole core industry' sampling frame using a mix of desk research [e.g. UK Space (trade association) membership, online industry job advertisements], UK Space Agency contacts, commercial databases (e.g. Experian or Companies House listings), and, possibly, 'cascade' contacts obtained in the survey process itself. Secondly, we would use appropriate 'filter questions' at the start of the survey questionnaire which would use criteria agreed with the Agency to assess the precise relationship of the organisation to space industry segments and, thus, to determine inclusion in the survey or not.

Defining the workforce, the right business unit, and the right respondent

We anticipate that the focus of the study is essentially on the needs for skills within the 'space specific' segments of workforces – essentially, on technological hardware and IT skills (in precision engineering, optical instruments, software engineering, etc) rather than on, say, shortfalls in administrative or domestic customer relations skills and labour supply. There will also be a requirement *within* particular occupational groups to understand whether and where skills supply problems (skills gaps and recruitment and retention problems) are ones which are specific to the space industry as opposed to being ones which more generally affect the occupational group (for example, the shortfalls in Level 3 engineering skills which are endemic across advanced manufacturing generally).

We anticipate that this focus will be achieved by a survey questionnaire which focuses (1) on specific, relevant, roles and (2) by surveying the right individual within the right business unit – e.g., in the case of large businesses e.g. in Airbus or BAE or BT or Sky, the aim would be

to survey a senior manager or HR specialist in the space divisions or technical operations divisions with specialist knowledge of the space/satellite operations of the business.

Ensuring survey representativeness

We note that previous surveys were undertaken online. However, such surveys have a strong potential for self-selection response bias. In this case, we propose a primary *telephone method* with an online backup (if respondents prefer to respond in that mode). Depending on the final questionnaire design, online backup might also be valuable in allowing larger businesses to report detailed numeric data which, for such large businesses, may not be immediately to hand.

The telephone survey method approach has much greater capacity to ensure the participation of all types of organisation (rather, say, than just attracting those which are generally pre-disposed to wider sector engagement). It also has greater capacity to control the individual who responds to the survey and thus to ensure that the respondent is the person with the most knowledge on which to base their responses.

Dealing with industry concentrations

The UK industry is highly 'skewed'. Its activity and employment are concentrated in fewer than 20 large businesses (mainly in the applications/downstream segment). Around 80% of total industry output is generated in London, the South East, and the East of England (though 'brass plate' allocation of revenue may exaggerate this effect a little).

The ITT suggests that the study should achieve a minimum of 150 interviews from around the 1000 relevant organisations which will be contacted and that analysis at county or LEP level should be undertaken.

Clearly, there will be limits to the extent of the latter form of analysis given the relatively small total number of industry organisations, their highly skewed underlying distribution, and the somewhat smaller number of interviews which will actually be achieved. We would, say, expect good representation from the Oxfordshire and Cambridgeshire space clusters but not, of course, from other sub-regions outside the SE/East/London where the industry has little or no presence. Our approach to address this issue would basically be (1) to examine the structure (size bands, sub-sectors, geographical distribution) of the industry once a final database/sampling frame had been collated (2) to agree with the Space Agency the *minimum* total sample which was to be achieved (3) to further agree with the Agency, within the total sample, minimum quotas for subdivisions of the industry which appropriately reflected the actual distributions in the population of organisations (for example, UK regions/sub-regions would be represented in relation to their actual populations of organisations but there would be particular emphasis on the achievement of responses from larger organisations where employment is concentrated).

Designing an appropriate questionnaire

We recognise the content of the on-line questionnaire which was used in the last edition of this survey. Our observations on questionnaire design and content are set out below.

First, we should clarify with the Agency the extent to which the direct trend comparability with that previous question set needs to be maintained. Of course, the present survey will cover much of the same ground and if a high degree of trend analysis is required, we would retain all relevant question wording. However, if, rather, only a new, 2020, baseline is required we would suggest improvements to increase the precision of some questions.

Second, in any case, a telephone method, as we propose, allows greater capacity for questionnaire content (typically, a 20-25 minute interview allows for around 40-60 questions) and additional content (new issues and/or greater detail on existing ones) will be possible. Some themes which may be valuably explored might include, for example:

- As Brexit matures it may be useful to examine its impacts, probably with specific reference to the actual or potential impacts on skills demand and supply of a 'points-based' immigration system and of whatever UK/ESA relationship emerges.
- The previous questionnaire asked respondents for their growth expectations and other perceptions in relation to 'the next five to 10 years'. In our experience, few businesses operate to such distant time horizons and answers to such questions, particularly by SMEs, are aspirations rather than dependable predictions.

While the ITT requires the survey to contribute to a skills 'foresight' with a 10-year time horizon, it may be useful, *additionally*, to include more specific questions related to performance and employment growth over a recent period (the last 3 years), to formal business and investment plans for 3 years ahead (the typical business planning period), and specific recruitment implications of these plans. Such questions may allow a more concrete estimate of industry growth potential (albeit with a reduced time horizon). (We note that this '3 year' approach was used by London Economics in surveys undertaken in preparation for the 'industry size and health' reports sponsored by the Agency).

We also note that BMG has used this type of question set (for example, in analysis of the national Small Business Survey which we undertake on behalf of BEIS) to undertake industry segmentation analysis. This typically divides business populations into clusters with different styles and rates of growth (often associated with locations, business models, subsectors, etc), each having different implications for employment and skills demand. This kind of segmentation can be valuable in assisting external support bodies (such as the UK Space Agency) to further understand industry structures and to adjust support policies accordingly.

- The ITT, in setting out project aims, makes clear that it expects the survey to contribute significantly to policy formation and sector action (e.g. development of new training, establishment of a Space Sector Skills Institute, curriculum for a new GTP, etc.).

This suggests that a questionnaire on this occasion should have a more clear emphasis not just on skills needs and shortfalls but on, for example: (1) clear identification of what the business needs (and, if necessary, will pay for) in terms of *specific* courses (2) awareness understanding, and evaluation of current provision (3) participation in collaborative skills development (e.g. partnership with HEIs in curriculum development, work experience, Degree Apprenticeships, etc.) and interest in establishing or further developing participation.

The qualitative research element

With its focus on employers, the study is primarily concerned with perspectives on the industry's skills issues from the demand side. The qualitative element of the study will be used substantially to add qualitative detail and interpretation to this quantitative survey data on skills issues.

However, we suggest it will be possible and valuable to use additional qualitative interviews to generate further insights into the issues from agencies and HEIs (Cranfield, Southampton, Bath, etc) with intermediary and skills supply functions in the industry. These will allow additional insights into the demand picture from an alternative perspective – typically, in our

experience, identifying instances where employer identification of lack of provision in demand-side survey interviews is, in fact, a lack of employer knowledge of course availability or expectation that provision should (unrealistically) be perfectly specific to the single employer need or unwillingness to pay for provision

Summary: understanding the project environment

We have interpreted 'understanding the project environment' not, mainly, as a requirement to re-state a range of descriptions and statistics on the industry which are readily available from a variety of industry reports and national space policy documents, most of which have been sponsored by the Space Agency itself.

Rather, we have used this section to emphasise that BMG understands the 'project environment' as essentially being the Space Agency's need to deliver a high-quality, policy-orientated skills study able to withstand any reasonable scrutiny and capable of informing the industry's future progress.

Thus, we have summarised the major challenges to the study's effective delivery, identified areas in which we believe the present study can improve on previous ones, and re-asserted our belief that we have the skills and capacity to fully achieve the study's aims and objectives.