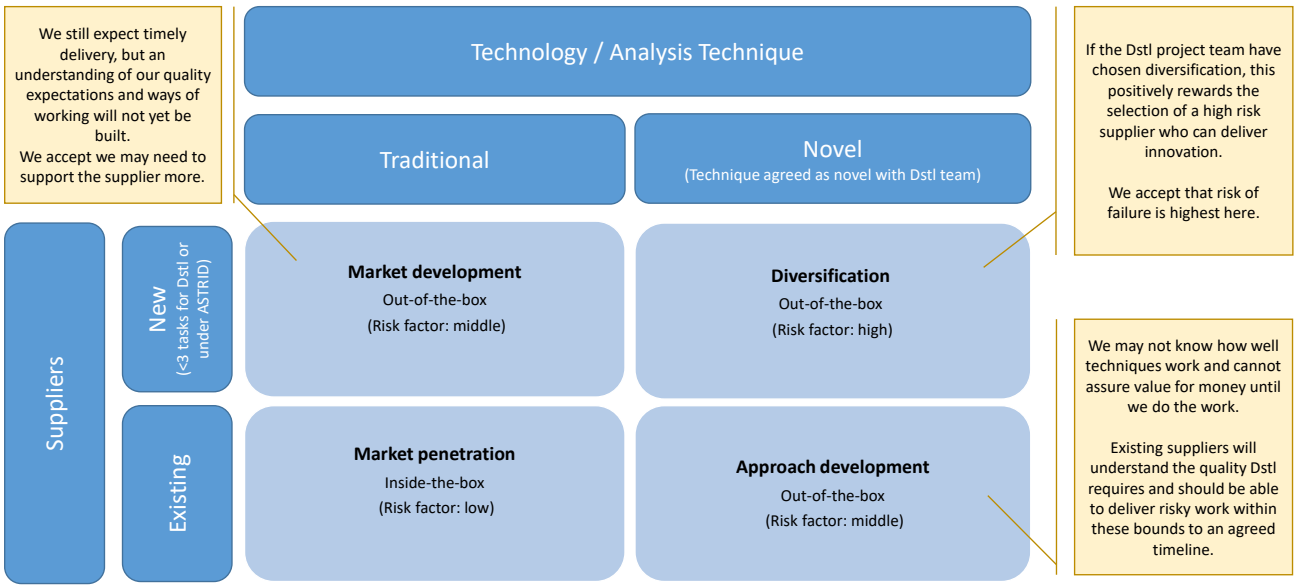
Statement of Requirement (SOR)

Contact & Project Information:

Project Manager	Name	[REDACTED]		
	Email	[REDACTED]		
	Telephone number	[REDACTED]		
Technical Partner	Name	[REDACTED]		
	Email	[REDACTED]		
	Telephone number	[REDACTED]		
PJ number	[REDACTED]	**CHESS leaf code**	[REDACTED]	
Owning division	[REDACTED]	**Delivering division**	[REDACTED]	
Programme	AI Programme			
Indicative task budget(s) £k	Core / initial work:	£ 50k	Options / follow on work:	£ 50k

Innovation risk appetite:	Low
Narrative (if applicable):	

Using the Ansoff matrix below, please indicate your risk appetite with regards to accepting innovative bids/solutions. The type of analysis/experimentation technique is included within 'Technology/Product'.



Use of Outputs: *(This section is used to inform risks, liabilities, mitigations and exploitation)*

Intended uses (including the approximate time before use and any key decisions that will use the output):

Support of MSSA Task 6.2 – Use Cases, Vignettes and Measures of Effectiveness.
See LoCL spreadsheet for risks, mitigations and liabilities.

Possible uses:

Excluded uses:

Risk Assessment Process:

Project teams are required to complete the ASTRID Liabilities spreadsheet that will look at the direct and indirect risks associated with the work. The assessment must be completed at the outset before the draft SOR is submitted, this will prevent delays and lessen negotiations when the proposal is received.

The risk assessment spreadsheet can be found in the document list on the ASTRID Nexus Homepage:

[REDACTED]

Some generic risks are pre-filled so please ensure they apply to your task and delete/add as necessary. Each risk must be assessed in turn and a score entered in the spreadsheet. They will be automatically marked and a colour code produced. Please enter the results in the boxes below. A completed copy of the spreadsheet must be attached to this SOR when submitting it to the [REDACTED] for review and approval to release to CORDA.

Direct Risk	[REDACTED]

In the event that a direct risk is scored as “Green” or “Yellow” the risk will be capped at pre-agreed limits of liability and the project team may continue with the submission of their requirement to CORDA once all necessary approvals have been issued by the [REDACTED]

In the event that a direct risk is identified as “Amber” or “Red” project teams should discuss the requirement with their Commercial POC before the task is submitted.

Indirect/Consequential Risk	[REDACTED]

In the event that the indirect risk is “Excluded” project teams may continue with the submission of their requirement to CORDA once all necessary approvals have been issued by the [REDACTED]

In the event that the indirect risk is identified as “Included” project teams should discuss their requirement with their Commercial POC before the task is submitted.

Levels of Technical Assurance:

The framework offers three levels of Technical Assurance Support, and you have the ability to determine which level is suitable for your task.

Full guidance listing the types of support under each level (and the trade-offs) can be found in the “ASTRID Guide – Levels of Assurer Support” [REDACTED] or in the document list on the [REDACTED]

It may be that the level of support you require changes in the early discussion phase. Please ensure the final version of your SOR has the correct level indicated.

Please indicate below which level you require.

Minimum ☐	Standard ☒	Enhanced ☐

Statement of Requirement (SoR)

Project's document ref	**AST183 - MSSA T6.2 Sub-Threshold Vignettes**
Version number	**1.0**
Date	**01/08/2022**

1.	**Requirement**
1.1	**Title (including AST/ prefix)**
	AST183_Sub-Threshold Vignettes
1.2	**Summary**
	In order to develop Machine Speed Strategic Analysis (MSSA) capabilities into tangible demonstrations of generation after next technologies specific use cases are required. These use cases are an application and assessment of the capabilities carried out against understood vignettes and measured against well-articulated Measures of Effectiveness (MOEs). This requirement seeks to develop **vignettes**, with a description of the situations, the actors and their goals.
1.3	**Background**
	The Machine Speed Strategic Analysis (MSSA) project received funding under the Integrated Review to undertake research to enable the UK to undertake Intelligence, Surveillance and Reconnaissance (ISR) of the sub-threshold information environment. This will enable UK Government and Defence to process and understand the vast quantity of data at machine speed and to utilise advanced technology to infer intent and evaluate plausible responses. The project is intended to improve the options for UK MOD to be able to undertake the ISR of the sub-threshold developing the technology and understanding to be able to deliver system and sub-system demonstrators to improve the UK ability to: • Understand the actions in the sub-threshold, and to be able to identify which are, or appear to be malign; • Increase the UK ability to understand the implications and reach of our own defence activities in the sub-threshold; • Attribute actions to actors;

	• Identify likely or plausible intent or consequences; • Propose plausible response options. In the first year of the project, MSSA sought to identify recommendations for research to be carried out in future years of the project predominantly focusing on planning the next three (and seven beyond that but with less certainty) years of S&T effort to be applied in pursuit of MSSA's objectives. Over the next three years, MSSA will be seeking to explore and develop these recommendations.
1.4	**Requirement**

	This task requires development of vignettes which will later form the bases of use cases to test potential capabilities. In order to develop MSSA capabilities into tangible demonstrations of generation after next technologies specific use cases are required. These use cases are an application and assessment of the capabilities carried out against understood vignettes and measured against well-articulated Measures of Effectiveness (MOEs). As a MOE has to be assessed against a particular purpose they will be developed alongside the generation of the use cases. This task will not require the generation of use cases or MOEs, however the vignettes should provide a firm foundation for the generation of use cases and MOEs. In particular an understanding of what the actors are trying to achieve which will allows the generation of MOEs. For the purposes of MSSA the definition of sub-threshold is: Operations and / or activities carried out with the intention of affecting a competing power but which will not result in reasonable grounds for retaliatory military action. The effects are likely to be those seen in DIME[1] or PMESII[2]/ASCOPE[3] and activities may be targeted towards any individual or group and not just military units / organisations. This includes affecting a different competing power in order to alter perceptions and dispositions towards the targeted power. Sub-threshold operations and activities are not necessarily covert (where the activity is detected but the actor is not) but are expected to be at least ambiguous (where the activity is detected and the actor, or objective, is suspected but not proven) and are not limited to the information environment. For the purposes of MSSA, consideration will be given to activities taking place in the information environment and the 'footprint' left there by activities happening across the span of all five domains (land, air, maritime, space and cyber). This task is to provide a taxonomy and examples of "Sub-Threshold" vignettes, in a current and near future time frame. A vignette is a situation which allows the dynamic exploration of problem in order to obtain useful insights. Initially the vignettes should be at Official or Official Sensitive but with the capability to be expanded into higher classifications at a later date. The vignettes are to provide a setting to explore the "Sub-Threshold" for a wide variety of purposes. In particular, the vignettes will be used to derive use cases for our sub-system and system level demonstrations. Although the MSSA project is focused on the information environment, the vignettes should cross all relevant domains in order to insure that the correct information requirements are identified. The vignettes should range from the tactical to the strategic and will be used for the following purposes: • Definition and scoping • Exploration

[1] Diplomacy, Information, Military, and Economics
[2] Political, Military, Economic, Social, Information, and Infrastructure
[3] Areas, Structures, Capabilities, Organization, People, and Events

- Testing

These purposes will be explained in more detail below, but broadly the vignettes become more structured and specific with each level. It is not expected that all vignettes will cover all areas or that the initial set of vignettes will provide comprehensive coverage of the problem space. Indeed, one of the tasks of the vignettes will be to help define what would be required for comprehensive coverage.

Taxonomy

The task will generate a taxonomy in order to allow a user to quickly identify vignettes that serve their particular purpose (or identify a gap, which requires additional vignettes to be developed). No taxonomy of a complex system can be complete or perfect but a well-designed one should aid understanding and longevity of a repository of information such the vignettes.

The factors included taxonomy should be discussed as the taxonomy and vignettes are developed but should consider including

- Scale
- Type
- Classification
- Domains
- Time Frames
- Evidence for Validation
- Validation state (for given purposes)

There is considerable expertise within Dstl on the design of taxonomies, with successes and pitfalls and hence the contractor should work with the Technical Partner (TP) to make use of that expertise.

Description of Vignettes

Each vignette should be described in a consistent format, agreed with the TP, to allow users to quickly understand and compare different vignettes. It is likely that vignettes will contain "actors" that is a cohesive group (government, organisation or even individuals) whose actions can change the dynamics of the vignettes and an "audience" (government, organisation or groups) who will react to the actions of the actors but not play an active role. Each audience will have a different range and scale of possible reactions to each actor. The response of audiences is likely to depend on how well the action correlates (or anti correlates) with their current "belief". The relationships between the actors and the audiences is likely to be the key factor in defining the vignettes.

Information included the description should include the below and any other elements agreed with the TP:

- Title
- Classification
- Brief description of situation
- Description of actors including for each
    - Objectives

- Resources
- Constraints
- Relationships with other actors or audiences

- Description of audiences, including for each
  - Relationships with actors and audiences
    - In particular their responsiveness to actions by actors
  - Range of reactions available for actions by each actor

Validation of Vignettes

For some purposes, the Vignettes will require Validation, which is a formal agreement that they are fit for a particular purpose.

It is not a requirement for the contractors to "validate" all the vignettes, however they should demonstrate the validation of a selection of the provided vignettes, for an agreed purpose, at least one per level. In addition they should provide any evidence they have on validity within the description of the vignette, and this should include some form of independent SME review as agreed between the contractor and the TP. Evidence to include includes:

- Comparison with real examples
- Evidence of testing in "war games" or other dynamic testing of the vignette

The methods Dstl will use to validate vignettes include:

- Subject Matter Expert (SME) face validation
- Historical comparison
- Doctrine comparison
- Testing in "war games"

Face validation is a simple test of using experts to agree that a vignette is useful. It is important to note that "useful" is a lower standard than "realistic", but for some purposes realism may not be required, for example simplifications or exaggerations of the real would can help explore an issue.

Historical comparisons are showing real world events which are similar, and doctrine comparison is showing real world plans which are similar.

Wargames range from the very simple to the highly complex, but in this case the minimum requirement is to use the vignettes in a competitive environment, with "players" for each actor stepping through potential scenarios. At its simplest this could be two people just talking though how a scenario might develop.

Vignettes for Definition and Scoping

By its very nature the definition and scope of the Sub-Threshold is uncertain and variable, being dependent on both context and perspective. The same action could be considered both above and

below “threshold” in different contexts and from different perspectives. These perspectives are unlikely to be self-consistent. With players considering an action reasonable if they do it and unreasonable if the same action is done to them.

One way to explore the complex nature of the threshold is through vignettes deliberately set on or over the thresholds. This is not just on the, upper, threshold of military operation, which represents one border, but to help distinguish between for example coercion and corruption. Is the nation “just” trying to exploit the situation for financial gain rather than a long term plan to change the situation?

Questions that these vignettes can help answer include:

- How do we identify threatening sub-threshold activity?
- Are our definitions of thresholds consistent with other actors?
    - How do different actors view the same actions?
- What is the difference be between corruption and coercion?
- What the key questions to ask to understand a particular situation?
- How the same actions look from different perspectives?

Given the broad scope of this role, the vignettes do not require a high level of validation. They only need enough credibility that they allow realistic questions to be asked. It is unlikely that strict MOEs will be applied to these. On the other hand because they are definitional it is important that they are credible enough and thus there needs to be clear explanation of why the vignette was generated.

Vignettes for Exploration and Experimentation

In order to understand the complex interaction space of the Sub-Threshold, vignettes will be needed with a high degree of flexibility to allow an exploration of the potential space. In particular explore how the evolution of a scenario changes in reactions actions carried out by the players and changes in assumptions. In order to be able to isolate the effects changes, the vignettes will need to be more rigidly defined than the vignettes for definition, in particular the “key” assumptions need to be clearly defined.

Example questions for exploration include:

- What is the relationship between cause and effect?
- What approaches might work?
- What would players like to be able to do?
- What are possible enemy courses of action?
- What changes to the vignette would cause a particular approach to work or not work?
- What MOEs are useful in understanding the outcome?

The description of the vignette should include the key assumptions that drive the dynamics of the vignette and give an indication of the range of changes to these assumptions available without breaking the vignette. Vignettes for experimentation will be used to generate MOEs for testing, but

the vignette description should include examples of what types of MOEs could be generated by the vignette.

Vignettes for Testing

Ultimately, any theory about the nature of the interactions or the efficacy of possible interventions will need to be tested in a robust way. This will need tightly defined vignettes where the variables are reduced to those being tested and there will need to be confidence that the reaction of the situation to changes in those variables is credible. The key assumptions will need to be clearly defined and their impact understood. As Artificial Intelligence (AI), at least at current technology, struggles with problem ambiguity it is likely that it will need to be developed using testing level vignettes.

Example questions for experimentation include:

- Should resources be invested in this capability?
- Which approach is more likely to succeed?

Answers to these questions will be measured in the MOEs developed by the other scenario types. As an MOE is a test of fitness for purpose it will not be possible to formally define MOEs until the vignettes are applied to a purpose in a use case, however suggestions of purposes and MOEs should be suggested.

The validation of testing scenarios will need to be robust and in particular the internal dynamics will need to be worth well understood and realistic. The contractor is not required to provide this level of validation for the all the provided testing vignettes but is required to have demonstrated it possible using a small number (more than one) agreed with the TP.

Delivery

Phase 1:

Task: Proof of concept phase which will deliver the taxonomy and at least 4 example vignettes of each type, as agreed with the TP.

Indicative cost: [REDACTED]

Duration: 3 months.

Break Point: If the example vignettes or taxonomy are not suitable then the contract will end

Optional Phase 2:

Task: Delivery of at least 10 addition vignettes of each type

Indicative cost: [REDACTED]

Duration: 3 months.

	Skills Ideally the contractor should be able to provide expertise in both: • The geopolitics of Sub-Threshold (both modern and historic) ○ In particular the complex interactions across the domains of Political, Military, Economic, Social, Information, and Infrastructure. • The development of vignettes. However **the key expertise required is in the geopolitics, of sub-threshold situations**, as if required Dstl can provide support in the area of vignette development. This will obviously require an adjustment of the budget. **Task/Contract Management expectations** Fortnightly progress and technical reviews (telecoms) are expected as part of the delivery of this work. Close working and direction from the Dstl Technical Partner is required to ensure coherence with other MSSA project work undertaken in parallel.
1.5	**Options or follow on work**
	Phase 2 of this work will be optional following a decision gate at the end of Phase 1. Follow on work: If Phases 1 and 2 are successful then there may be follow on work adding breadth or depth to the set of vignettes.

1.6	Deliverables & Intellectual Property Rights (IPR)						
Ref.	**Title**	**Due by**	**Format**	**TRL***	**Expected classification (subject to change)**	**What information is required in the deliverable**	**IPR DEFCON/ Condition** *(Commercial to enter later)*
Example D – 1	*Quarterly Progress and Technical Review (QPTR 1)*	*T0+3 Months*	*Presentation (.pptx)*	*n/a*	*OS*	*Presentation pack to include but not limited to:* *• Update on technical progress* *• Progress report against project schedule.* *• Review of risk management plan.* *• Commercial aspects.* *• Review of deliverables.* *• Risks/issues.* *• GFA and supplier performance*	*DEFCON 705 shall apply*
D1	Phase1 Proof of Concept	T0+3months	To be agreed		[REDACTED]	Taxonomy and at least 4 example vignettes of each type, as agreed with the Dstl TP	[REDACTED]
D2 (option)	Phase 2 Vignettes	T0+6months	To be agreed		[REDACTED]	Delivery of at least 10 addition vignettes of each type.	[REDACTED]

*Technology Readiness Level required, if applicable

1.7	**Standard Deliverable Acceptance Criteria**
	Deliverable Acceptance Criteria (As per ASTRID Framework T&Cs) 1. Acceptance of Contract Deliverables produced under the Framework Agreement shall be by the owning Dstl or wider Government Project Manager, who shall have up to 30 calendar days to review and provide comments to the supplier. 2. Task report Deliverables shall be accepted according to the following criteria except where alternative acceptance criteria are agreed and articulated in specific Task Statements of Work: • All Reports included as Deliverables under the Contract e.g. Progress and/or Final Reports etc. must comply with the Defence Research Reports Specification (DRRS) which defines the requirements for the presentation, format and production of scientific and technical reports prepared for MoD. Reports shall be free from spelling and grammatical errors and shall be set out in accordance with the accepted Statement of Work for the Task. • Interim or Progress Reports: The report should detail, document, and summarise the results of work done during the period covered and shall be in sufficient detail to comprehensively explain the results achieved; substantive performance; a description of current substantive performance and any problems encountered and/or which may exist along with proposed corrective action. An explanation of any difference between planned progress and actual progress, why the differences have occurred, and if behind planned progress what corrective steps are planned. • Final Reports: shall describe the entire work performed under the Contract in sufficient detail to explain comprehensively the work undertaken and results achieved including all relevant technical details of any hardware, software, process or system developed there under. The technical detail shall be sufficient to permit independent reproduction of any such process or system. 3. Failure to comply with the above may result in the Authority rejecting the Deliverables and requesting re-work before final acceptance. 4. Acceptance criteria for non-report Deliverables shall be agreed for each Task and articulated in the Statement of Work provided by the Contractor
1.8	**Specific Deliverable Acceptance Criteria**

2.	Quality Control and Assurance
2.1	**Quality Control and Quality Assurance processes and standards that must be met by the contractor**
	☐ **ISO9001** (Quality Management Systems) ☐ **ISO14001** (Environment Management Systems) ☐ **ISO12207** (Systems and software engineering — software life cycle) ☐ **TickITPlus** (Integrated approach to software and IT development) ☐ **Other:** (Please specify)
2.2	**Safety, Environmental, Social, Ethical, Regulatory or Legislative aspects of the requirement**

3.	Security	
3.1	**Highest security classification**	
	Of the work	[REDACTED]
	Of the Deliverables/ Output	[REDACTED]
	Where the work requires more than occasional access to Dstl premises (e.g. for meetings), SC Clearance will be required.	
3.2	**Security Aspects Letter (SAL) – Note the ASTRID framework has an overarching SAL for quotation stage (up to OS)**	
	Framework SAL If yes, please see SAL reference- *Enter iCAS requisition number once obtained*	
3.3	**Cyber Risk Level**	
	[REDACTED]	
3.4	**Cyber Risk Assessment Reference (RAR)**	
	[REDACTED] This must be completed before a contract can be awarded. The Project Manager needs to complete a Cyber Risk Assessment. There is currently an interim process in place. Please fill in this [REDACTED] and email to [REDACTED] to complete the assessment. The Cyber Risk Profile and a Risk Assessment Reference (RAR) should be provided by email return within 2 working days. For more information: [REDACTED]	

4.	Government Furnished Assets (GFA)

GFA to be Issued - Yes

If 'yes' – add details below. If 'supplier to specify' or 'no,' delete all cells below.

GFA No.	Unique Identifier/ Serial No	Description: *Classification, type of GFA (GFE for equipment for example), previous MOD Contracts and link to deliverables*	Available Date	Issued by	Return or Disposal *Please specify which*
GFA-1	[REDACTED]	[REDACTED]	Contract Start	Dstl TP/PM	Disposal at Contract End

If GFA is to be returned: It must be removed from supplier systems and returned to the Dstl Project Manager within 2 weeks of the final Task deliverable being accepted. (Any required encryption or measures can be found in the Security Aspects Letter associated with the Task).

If GFA is to be destroyed: It must be removed from supplier systems and destroyed. An email confirming destruction should be sent to the Dstl Project manager within 2 weeks of the final Task deliverable being accepted

5.	Proposal Evaluation
5.1	**Technical Evaluation Criteria**
	Process will be as per ASTRID Framework T&Cs. If particular attention should be paid to certain aspects of the requirement, please confirm here:
5.2	**Commercial Evaluation Criteria**
	As per ASTRID Framework T&Cs.