ANNEX D – Call-Off Tasking Form

Call-Off Tasking Form Part A

CALL-OFF TASKING FORM [TO CONTRACTOR]

To: IBM	**From:** Dstl,

REQUIREMENT *(to be completed by Dstl Demand Owner)* **Date Quotation Required:**			
Project Manager	[REDACTED]	Technical Lead	[REDACTED]
Call-Off Task Title:	ARA WP2.1 Adaptable Comms Policy Generation & Verification Support Tools	**Call-Off Task/Change**	
Required Start Date:	15/09/2021	**Required End Date:**	15/03/2022
Requisition No:	1000167642		

CALL-OFF TASK DESCRIPTION AND SPECIFICATION *(to be completed by Dstl Demand Owner)*

Call-Off Task to be completed under Firm Price X Ascertained cost ☐

RISK ASSESSMENT Completed Y/N (NA – Office Working)

DEFCON 602A (Quality Plan) Y/N

DEFCON 602B (Quality Plan) Y/N

DEFCON 76 (Contractor's Personnel on The Authority's Premises) ☐

Statement of Requirement Reference no: (detail ownership, where background IPR is known, for each Deliverable).

Call-Off Task Deliverable: Acceptance / Rejection Criteria

DEFCON 524 Rejection ☐ Period [10 Days] As described below

DEFCON 525 Acceptance ☐ Period [10 Days] As described below

Task Description

Background

The environment into which MOD is deploying communications infrastructure is becoming increasingly complex as contention for available spectrum increases and the threat posed by adversaries becomes ever

more sophisticated. There are several approaches that can be taken to improve resilience and agility of our systems to support sustainment of communications in theatre. Example approaches include:

- Diversity of bearers, allowing more choice over what underlying bearers are utilised in particular operational environments.
- Agility within the bearer itself, to enable more options for communications both spatially and across a range of frequencies.
- Enhanced exploitation of limited resources to sustain communications for as long as possible in the face of disruptive events.

The management and control functions that enable the above approaches will be influenced by policies that indicate preferences and behaviours the user would like the infrastructure to exhibit.

The long term vision is that the management and control can be implemented as autonomous functions that are able to learn appropriate courses of action, exploiting advances in artificial intelligence and machine learning. In the short term, however, they will typically be implemented as fixed algorithms that process policies to determine the appropriate actions to take in a given situation.

Underpinning this functionality will be policy definition, and the translation of user defined policies into a form that can be interpreted and actioned by policy enforcement and decision functions within the system.

Requirements

The Autonomous Resilient Architectures project requires research to be undertaken into the capture of user preferences into a policy that can then be translated into a form that is readable by underlying systems. A simplified representation of the scope of the task is provided in Figure 1.

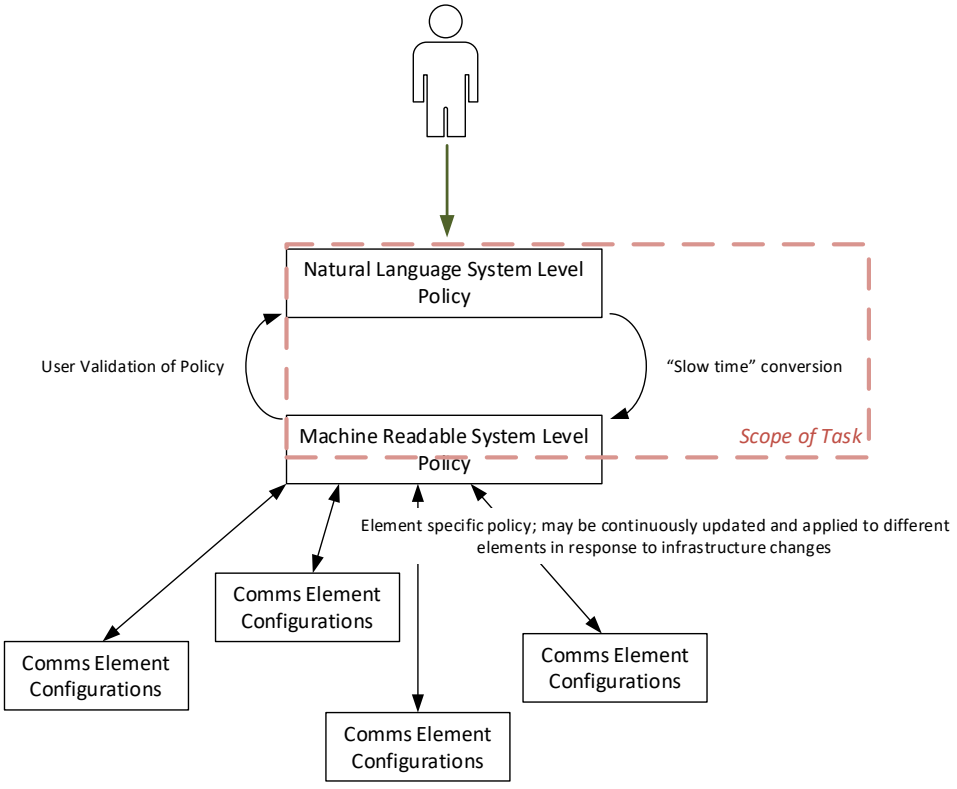

Figure 1: Simplified Overview of Task Scope

In the diagram, the user (for example a J6) has some "intents" for the infrastructure that they wish to specify. Examples include:

- "I want voice to take priority over logistics data for set of users {A}"
- "Minimise probability of intercept at the cost of throughout for non-voice traffic"
- "FMV applications should only use bearers with minimum capacity X."
- "High priority video streams should continue to send as available bandwidth decreases at the cost of quality until threshold y is reached"

A toolset is needed that will take those intents and capture them in a natural language policy that is intuitive to read and understand. This natural language system level policy is then converted into a machine readable system level policy – where it can be checked for conflict and internal consistency.

The machine readable system level policy is used to generate element specific policies that are applied to components of the communications systems. Note: this conversion may be highly dynamic in order to e.g. specify appropriate identifiers or areas of the infrastructure where the policy is applied dependent on aspects such as flow of information across the infrastructure and communities of interest.

The scope of this research task is on the capture of the natural language system level policy and the conversion of this policy into a machine readable system level policy. Mapping of the machine readable system level policy onto the communications elements will be address by a parallel task. This task also excludes:

- coalition policy definition
- user validation of captured policy
- Artificial Intelligence (AI) and Machine Learning (ML) algorithm development.

Although AI/ML algorithm development is out of scope, Dstl aspire to increase the autonomous function of the policy management system, and this must be considered as part of this research. For example, a ML component could analyse historical observed data, including contextual information from cameras, microphones, infrared, etc., alongside previous decisions taken to learn a policy, or a set of policies, for a range of possible system behaviours. Then, in line with a defined user intent, relevant learned policies could be presented to the user for verification/modification, and then automatically deployed. This would assist the user by enabling analysis of previous data and decisions or actions taken.

The main output of the task is a prototype toolset that can be used to capture user defined intents and output a machine readable system level policy that has be internally verified to ensure aspects such as correct syntax and elimination of conflicting policies.

The task must undertake the following activities:

1. Definition and capture of an illustrative set of intents
2. Review of current commercial landscape to assess how vendors are moving toward supporting policy driven communications architectures. Examples include Cisco's DNA Centre and SD-WAN solutions for network intents, and other vendors may also support adaptive application policies.
3. Review of toolsets that can be used to capture natural language policies. Prior work on this has been conducted by previous projects (see GFX), so a quick survey to see whether/how the state of the art may have moved on is needed.
4. Development of recommendations for how to convert the natural language policies into machine readable policy files, and what degree of validation should be applied to the output policy.
5. Analysis of the feasibility of creating a learning task to support generation of policies based on ML techniques. This should outline the necessary steps required by such a learning task, including enumerating different attributes relevant to a particular domain.
6. Development of a prototype toolset to support the above conversion, and to demonstrate its operation to Dstl stakeholders.

7. If feasible, development of an example learning task to enable future work in integrating a ML component into the policy management framework.

The ultimate goal is to integrate the developed toolset into a larger concept demonstrator, but details of this demonstrator have not yet been defined.

It is expected that this research activity will draw on previous work in this area including (but not limited to):

- Prior ITA research on natural language processing and policy learning
- Previous Dstl research outputs as listed under GFx.

DELIVERABLES *(to be completed by Dstl Demand Owner) (state what is required e.g. reports etc)*

The research should deliver the following outputs to Dstl:

1. Report outlining the research undertaken, the outputs of review activities and the reasoning behind the approach adopted for the prototype toolset.
2. Prototype toolset and any associated source code/software for capturing user defined intents and producing a machine readable system level policy that has be internally verified to ensure aspects such as correct syntax and elimination of conflicting policies. This should include user documentation for how to set up, run and use the prototype toolset.
3. A short report and presentation as to how the approach developed could be extended using policy learning approaches, to enable further autonomous system behaviour.

Interim Report ☐ **State how many if Interim ___** **Final Report** ☐ **Assets Generated** ☐

Detail supply of any materials for each deliverable and required due date:

1. Research Grade Software Model with outline user guide and scenario data files
2. Report describing the modelling framework, its utility and benefits.
3. Demonstration of the initial simulation model
4. Documented presentation describing the initial simulation model

ISSUE OF EQUIPMENT/MATERIAL/INFORMATION *(Tick all relevant boxes and detail what has been issued)*

Not Applicable ☐ **Government Furnished Equipment** ☐ **Government Furnished Information** ☒

Government Furnished Facilities ☐

Details of equipment / information / facilities: Influence Scenarios

Accounting for Government Property (DEFCON 694):

Contract Embodiment Item ☐ **Contract Support Item** ☐ **Contract Work Item** ☐

QUALITY STANDARDS *(Define the applicable Allied Quality Assurance Publications (AQAPs) and Defence Standards (Def Stans)).*

SECURITY CLASSIFICATION OF THE WORK *(A Security Aspects Letter (SAL) amendment will be required for each Call-Off Task where additional security aspects are not stated in the overarching SAL)*

UK OFFICIAL X UK OFFICIAL SENSITIVE ☐ SECRET ☐ TOP-SECRET ☐

Commercial Contact	[REDACTED]
Contact Number	[REDACTED]

Any Call-Off Task placed as a result of your quotation will be subject to the Terms and Conditions of Contract Number DSTL/AGR/00803/01

CALL-OFF TASKING FORM [Return from Contractor]

To: Dstl FAO: Tel: Fax:	**From:**

1. **Proposal Reference** GRPK0AAP v2.0 dated 4th September 2021**.. (attached)**

The proposal shall include, but not be limited to:

- A full technical proposal that meets the individual activities that are detailed in Statement of Requirement (Part A to Draft call-off tasking form).
- Breakdown of Deliverables and Interim Payments (Milestone/stage) due dates
- A work breakdown structure/project plan with key dates and Deliverables identified including required delivery dates for Government Furnished Assets.
- A clear identification of Dependencies, Assumptions, Risks and Exclusions which underpin your Technical Proposal.

COST BREAKDOWN *(to be completed by the Contractor)*

You are to apply Man Day rates in accordance with Annex E.

Provide a price breakdown which should include, but is not limited to: labour costs, direct costs i.e. facility charges, transportation, Sub-Contracting breakdown, travel and subsistence, overheads and profit. In support of your proposal you are requested to provide clear details of all dependencies, assumptions, risks and exclusions that underpin your breakdown of costs.

Firm Price Quotation of £_148,897.50_____ (ex VAT) is submitted for **Call-Off Task No** DTIN 011_____ and breakdown attached

(Define alternative pricing when applicable).

Start Date: 13 September 2021 **End Date:** 15 March 2022

Signed on behalf of the Contractor: [REDACTED]

Name: [REDACTED] **Date:** 6 September 2021

Contractors Cost Breakdown

PROVISION FROM				
PROVISION FROM SUB-CONTRACTORS				
Service	**Cost £**	**Qty**	**Subtotal**	**Total**
Sub-Contracts *(provide a detailed breakdown in the cost breakdown box above)*				
Travel & Subsistence UK Road Mileage Accommodation Day and Night subsistence Other (Rail/Air) (provide detail)				
GRAND TOTAL				

GENERATED IP Provide details of IP generated by Sub-Contractors and ensure that a DEFFORM 177 has been completed and returned to the Authority.	
SUB-CONTRACTOR	**DETAIL OF IP GENERATED**

Milestones Deliverables and Payments

	Description	**Amount £**	**Due Date**	**Deliverable DEFCON (Please insert as appropriate)**
Milestone 1	Literature Review	26,820	31 Dec 2021	
Milestone 2	Software Toolset	62,525.50	28 Feb 2022	
Milestone 3	FastLAS learning task specification	34,908	28 Feb 2022	
Milestone 4	Final Report	24,644	15 Mar 2022	
TOTAL		**148,897.50**		

Call-Off Tasking Form Part C

1. Offer of Contract: *(to be completed by Dstl Call-Off Task owner and forward to Dstl Commercial Services for approval)*

Dstl Commercial Name: [REDACTED] **Tel: 01980 955075**

Approved Requisition Number: 1000167642

Commercial Approval: [REDACTED]

Purchase Order Number: 1000162785

Date: 15 September 2021

Please Note: Call-Off Task Authorisation to be issued by Dstl Commercial Services Department once the Purchase Order has been inserted. Any work carried out prior to issue is at the Contractor's own risk

2. Unqualified Acceptance of Offer: *(to be completed by the Contractor and return to Dstl Commercial Services)*

Contractor's Name: **Tel:**

Position in Company: **Signature :**

Date:

Please Note: Call-Off Task Authorisation to be issued by Dstl Commercial Services Department once the Purchase Order has been inserted. Any work carried out prior to issue is at the Contractor's own risk

2. COMPLETION OF CALL-OFF TASK *(to be completed by Contractor and returned to the nominated Dstl Call-Off Task owner as detailed in Section 1-* ***failure to return completed Part 3 could result in payment being delayed****)*

Confirmation of Deliverables as per part 1 Y ☐ N ☐

Actual Start Date: _____ **Actual Completion Date:** _____

Invoice Submitted on: _____ **For Firm Price of:** £ _____

Comments by Contractor on the Call-Off Task

Call-Off Task completed to Dstl's satisfaction *(to be completed by Dstl Call-Off Task owner)*

Signed: _____ **Date:** _____

Comments by Contractor on the Call-Off Task

THE DSTL NOMINATED CALL-OFF TASK OWNER SHALL FORWARD A COPY OF EACH COMPLETED CALL-OFF TASKING FORM TO: DSTL COMMERCIAL SERVICES