1st /2023 SCM Subject No 5

INTEGRATED AIR & MISSILE DEFENCE
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1st/2023 Steering Committee Meeting

POINT PAPER

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SUBJECT: **Systems Concepts & Integration - Sensors & Electronics Technologies 353 Research Task Group (SCI – SET – 353 RTG) "C-UAS Mission-Level Modelling & Simulation"**

No: 5

PURPOSE: To approve the participation in the activities of the aforementioned Task Group.

BACKGROUND: Although NATO and its partners have long recognized the utility of operating Unmanned Aircraft Systems (UAS), it has only been in the last decade that most NATO countries have started to build up means and forces that can counter these systems when they are used by an adversary against NATO's interests. The size of some Unmanned Aircraft (UA) makes these platforms hard to detect. The timelines involved with their operations are short, thus presenting a challenge for decision making. Existing means of engaging aerial threats are not always effective against UA and may not be sustainable in terms of available numbers and/or costs. Due to the low costs of UA and their ease of operation, it is possible to operate UA in large numbers, for example in a coordinated attack or when deployed as a swarm. This could easily lead to saturation of detection systems, an overload of the human operators and attrition of the effectors of a C-UAS system.

NATO has initiated several activities that enable the enhancement of C-UAS capabilities. While significant efforts are being taken to address the challenge posed by small UA (sUA) as a threat, it is felt that the current state-of-the-art of C-UAS capabilities is still developing and needs constant attention and progress to keep up with this new and ever-advancing threat.

ANALYSIS & STATUS: It is felt that effective M&S can enhance making requirements to systems, the numbers that are needed and selecting the right elements of a C-UAS system (i.e. Simulator Based Acquisition – SBA). It can also assist in performing scenario assessment and evaluation, including making a laydown plan during the preparation phase of a deployment. M&S can enable effective training, for example in a Live-Virtual-Constructive (LVC) setting.
With ever-increasing capabilities of UAS, enormous proliferation and widespread deployment of UA in recent conflicts, it is evident that C-UAS capabilities are relevant to NATO forces. Effective M&S can identify shortfalls of existing C-UAS systems in certain scenarios and reveal where improvements are needed in order to effectively deal with the threat. It can thereby truly contribute to C-UAS development, procurement, deployment and training.
The objective of the task group is to develop a common M&S framework that is capable of evaluating relevant scenarios at mission-level. The framework shall be able to model all relevant characteristics of the UA, the environment, detection methods, C2 systems and effectors. The modelling shall be performed at an effects-based level that is sufficient to capture the essential aspects of the C-UAS process. It is felt that in order to achieve this, it is not necessary to model a more detailed physics-based level in most cases. The framework shall subsequently be used for simulating certain selected scenarios. Ideally, the framework shall be verified by modelling scenarios that are executed at NATO trials, after which the results of the simulation and the real-life event can be compared.

FINANCIAL CONSIDERATIONS & FUNDING: Any financial impacts of the aforementioned activities will be covered from the existing budget of the current year (and by transferring of appropriations within the authorization granted to the Director in accordance with Financial Administrative Procedures, if required) without the need for a supplementary budget.
Any financial obligations for the next years will be foreseen in the shared budget of the respective Fiscal Years.

RECOMMENDATIONS & DECISION: SC members are requested to approve the participation of SMEs in SCI – SET – 353 Task Group, C-UAS Mission-Level Modelling & Simulation.

FOR THE IAMD COE:

B. Gen (OF-6) Nikolaos KOKKONIS GRC (AF)
IAMD COE Director

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