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Abstract:
When there is the likelihood of dual use/misuse on an item/technology, a number of ethical issues are instantaneously raised, essentially regarding the environment and humanity safety in addition to the respect of human rights. Therefore, this document is focused in potential dual use implications of the project, appropriate risk-mitigation strategies and in the due ethics checklists, to make sure ROBORDER complies with all EU ethics requirements.

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Executive Summary

As soon as we have an item/technology that can fall in erroneous hands (in a hypothetical situation), moreover, that could be misused by modifying and tailoring it in such a way that could be converted into a dual use item/technology, several ethical issues are instantaneously raised, essentially regarding the environment and humanity safety in addition to the respect of human rights. Therefore, this document is focused in potential dual use implications of the project, appropriate risk-mitigation strategies and in the due ethics approvals. A clarification of the dual use and misuse concepts will be made, H2020 guidelines and EU regulations will be explained and the appropriate ethics issue checklist carried out.

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List of Acronyms

Acronym	Meaning
GA	Grant Agreement
EC	European Commission
EU	European Union
LEA	Law Enforcement Agency
EEA	Ethical External Advisor
EAB	Ethical Advisory Board

Table 1 – List of acronyms.

1 INTRODUCTION

It is important to begin by reminding the following statement: "*only research that has an exclusive focus on civil applications is eligible for funding*[1]". Consequently and in view of the fact that ROBORDER is a H2020 project, lawfully speaking we are able to corroborate that ROBORDER does not have any dual use or misuse endeavor. Although, like any other item/technology that might fall in erroneous hands, it could be misused by modifying and tailoring it in such a way that could be converted into a dual use item/technology and misused. In the next section we explain both concepts.

We outline the 'circular bending process' diagram below (see Figure 1) with a sequence through the steps of the task process workflow, in order to illustrate our approach regarding this subject.

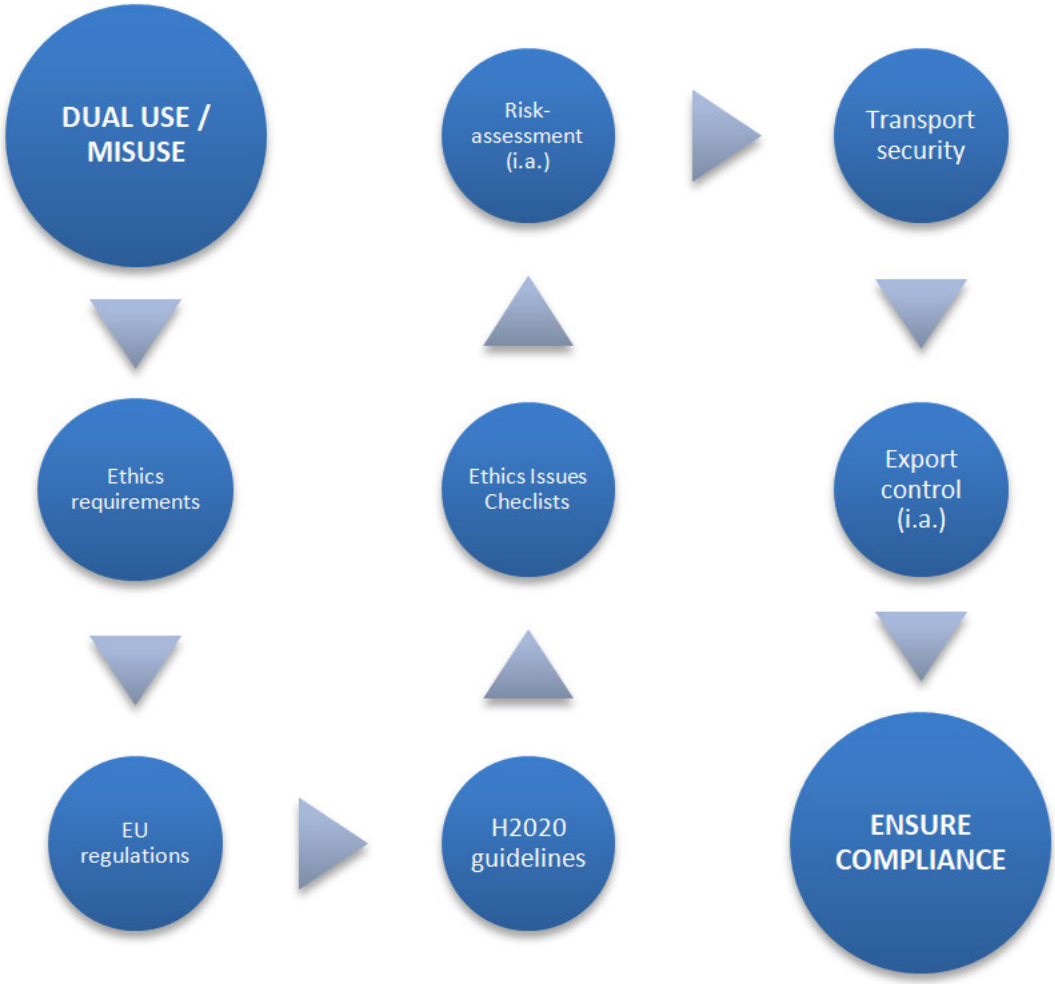

Figure 2 – 'Circular bending process' diagram.

[1] H2020 European Commission Guide on How to complete your ethics Self-Assessment and REGULATION (EU) No 1291/2013 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2013 establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020) and repealing Decision No 1982/2006/EC

2 Dual use vs. Misuse

According the regulation 428/2009 "**dual-use** items' shall mean items, including software and technology, which can be used for both civil and military purposes, and shall include all goods which can be used for both non-explosive uses and assisting in any way in the manufacture of nuclear weapons or other nuclear explosive devices".

A H2020 European Commission Guide on How to complete your ethics Self-Assessment suggests that dual-use research is "research that has the potential also for military applications (…) these dual-use items are normally used for civilian purposes but may have military applications, or may contribute to the proliferation of weapons of mass destruction."

Hence, it stands for something that might be used for equally nonviolent and military aims. For nonviolent we entail peaceful and diplomatic. Therefore, details on potential dual use implications of ROBORDER and risk-mitigation strategies are crucial, in addition to ethics approvals, if pertinent.

By **misuse** we mean wrong and incorrect use – a use that could harm someone or something. For that reason, ethical principles and values are decisive on a project like ROBORDER; accordingly they will be illustrated on the next section. The applicable EU and national law, mainly regulation 428/2009 regarding the EU export control, are also requisites that ROBORDER' project must comply with.

Coming back to the H2020 ethics course of action, there are some questions that the consortium used during the approach to identify potential misuse and they are:

- Could the materials/methods/technologies and knowledge involved or generated harm humans, animals or the environment if they were modified or enhanced?
- What would happen if the materials/methods/technologies and knowledge involved or generated ended up in the wrong hands?
- Could the materials/methods/technologies and knowledge involved or generated serve purposes other than those intended? If so, would such use be unethical?

3 Risk-mitigation strategies

Having in mind the latter questions, risk-mitigation strategies are critical as soon as we have an item/technology that can fall in erroneous hands (in a hypothetical situation), moreover, that could be misused by modifying and tailoring it in such a way that could be converted into a dual use item/technology, several ethical issues are instantly raised, essentially regarding the environment and humanity safety in addition to the respect of human rights.

As a result, EC warns that if a research makes use of classified information, materials or techniques; dangerous or restricted materials and if specific results of the research could present a danger to participants, or to society as a whole (if they were improperly disseminated), the jeopardy of ethical (potential) problems are, as well, immediately raised. However, it is not the case of ROBORDER project for a number of reasons: the core raison d'être is that the consortium will not put up for sale any product during the project' lifecycle; the consortium will simply carry out a simulation mock-up with every single of the suitable ethics approvals for the research with humans, with the due confirmation by the competent National Data Protection Authorities and with the proper approvals for the operation of UAVs so the exercise can be performed complying with all EU regulations and H2020 guidelines. In addition, there won't be cross-border transfers as it will be explained in the next section and the simulation mock-up will be performed within the EU, more precisely, in a consortium partner country (member state).

Nevertheless, risk-mitigation strategies are always a concern of the ROBORDER consortium: both 'Ethics Issue Checklists' in the section 4 of the present deliverable, as well as cautious appraisals from the consortium Security and Ethical Advisory Boards where steps to avoid any potential misuse and appropriate safeguards to cover security risks and training for researchers are carefully thought. Furthermore the Consortium involves human rights experts, in order to make sure that ROBORDER' research acts in accordance with all ethics and principles. In cooperation, they identify risks and devise strategies when required to diminish and deal with likely risks. It is important to state that both Boards are composed by seasoned professional in ethics, compliance and in the protection of classified material and matters of National Security.

3.1 Cross-border transfers

Regarding likely cross-border transfers, on the one hand, H2020 guidelines state that for “cross-border transfers of dual-use materials, technologies and information, you must observe the EU export control Regulation No 428/2009 and if you have any doubts, you should consult the relevant national export control authority to clarify whether transfer licenses are needed.” On the other hand and as stated in the Project’ Grant Agreement “the consortium does not foresee any exports (i.e. procedure of allowing Community goods to leave the customs territory of the Community). Hence, no authorizations will be required. If during the project, the situation changes and the consortium verify the need to export project technology or equipment, the General Export Authorization No EU001 (which applies to all items listed in Annex I of EU Regulation 428/2009) will be employed.”

3.2 Grant Agreement

As stated in the 5.1.5 of the Grant Agreement (GA), the ROBORDER project will address solely civilian needs which are much less demanding in terms of performance than military applications. Please see GA section’ parts quoted below:

While it may be argued that the technologies developed and used in ROBORDER have the possibility for dual use (i.e. use in both civilian and military applications), it should be noted that all technologies considered have been designed for the civilian market (namely public safety) or used successfully and further improved in civilian applications even if their original designs result from defence activities. The following paragraphs provide some more details on these aspects. A significant body of the work done in the area of Unmanned systems and passive radar has so far been motivated and funded by military applications, so the results of this project have the potential to be used back in the defence sector. Nevertheless, the technologies behind ROBORDER are not lethal or harmful technologies nor will they be developed and improved for military applications.

Despite counting with the participation of military organizations in the consortium, these have a long tradition of civilian work. For example, the HMOD has been joining effort with LEAs and contributing significantly to maritime border security and fighting criminal activities at sea in Greece as well as in other countries. An important aspect to bear in mind is that consortia should commit to not applying directly the knowledge developed with civilian funds in military applications and that adequate measures are put in place to ensure that no dissemination of sensitive aspects of the research work which may have higher degree of applicability to the military field takes place. As mentioned in the EC’s explanatory note on exclusive focus on civil applications, “Research activities aimed at the development or improvement of dual use technologies or goods can be financed through H2020, provided that the research is fully motivated by, and limited to civil applications”. This is precisely the case with ROBORDER which focuses on a strictly civilian application (land and marine border surveillance).

The consortium declared in the GA that it will not apply directly the research results of ROBORDER in military applications or in the military domain:

1. We will not use, follow, consider any military standard while implementing our system
2. We have no intention and we will not make any effort to solve two special issues which are essentially important for military use: jamming resistance and low observance
3. We will not design our system to be jam resistant other than resistance against natural and common unintentional artificial sources of interference (e.g. sunlight, normal background RF emission, etc.)
4. We will not deal in any way with the observability of our system. The active markers of the landing platform, the radio communication will be easily detectable with many commercially available devices.
5. We will use only commercially available technologies (e.g. GPS receiver, optical emitter and detector, RF modem, etc.) while implementing our system
6. We declare that the jamming and observance issues can't be solved with additional modification of the system. Only the complete redesign of the landing add-on might solve the problems.
7. The reason why this platform is proposed is because the commercial UAVs have significantly shorter flight endurance than military ones (some military UAVs can fly for up to 40 hours), so the solution is not needed in the military domain.
8. There are more complex platforms already available in the military domain having better ergonomy from the viewpoint of military use, see Patent 1. from listed patents (in GA)

The dissemination level of the ROBORDER's 'ethics requirements' work package is "Confidential, only for members of the consortium (including the Commission Services)" and technical deliverables have been classified as RESTREINT EU, hence, the research published results will be cautiously selected.

3.2.1 Misuse in GA

By definition, current research may be exploited by criminal organisations and individual criminals when planning to perpetrate acts of serious crime or terrorism. The research and applied knowledge acquired in this project has the potential to be exploited by terrorists or criminal elements due to the fact that the research and development area focuses on the identification of illegal activities and communications and will also research current operational capabilities and gaps through the user requirements tasks.

One of the key objectives of the Consortium will be to safeguard the material gathered by the partners throughout the research process and protect the outputs generated. The research conducted within ROBORDER and the tools developed within the project to achieve the project aims could be subject to dual use threat. It is of the utmost importance that a robust system is in place to ensure the work of the project is not exploited for subversive means. The Consortium has put in place a tried and tested management and security advisory system to protect the outputs of the project from being used in this manner. The security procedures detailed in GA Section 6 will be activated for the purpose of preventing dual use by terrorists and criminals.

As mentioned above, ROBORDER will take a lot of care in implementing security procedures to ensure the adequate protection of sensitive information which may have the potential to be misused by criminals or terrorists. In this sense, all technical deliverables have been classified as RESTREINT EU. As such, access to the information and data included in these documents will be provided on a need to know basis. None of the ROBORDER technical results will be available publicly. The only information made public will be related to the business model and potential market for ROBORDER solutions as well as general information about the solutions developed with no indication of performance or technical details of their implementation.

The classification of ROBORDER results, the application of security best practices (e.g. need to know) and the involvement of experienced security researchers as indicated in GA section 5.1.1.1, are considered sufficient measures to prevent the misuse of research findings.

4 Copies of ethics approvals

The table below complies exactly with the H2020 template regarding the dual use 'Ethics Issue Checklist'.

DUAL USE	Yes or No	Information to be provided	Documents to be provided
Does this research involve dual-use items in the sense of Regulation 428/2009, or other items for which an authorisation is required?	**YES**	*What goods and information used and produced in your research will need export licenses?* *How exactly will you ensure compliance?* *How exactly will you avoid negative implications?*	Copies of export licences.
Could your research raise concerns regarding the exclusive focus on civil applications?	**NO**	Explanations on the exclusive civilian focus of the research. Justify inclusion of military partners or military technologies *(i.e. explain how they relate to civilian applications, e.g. in the context of law enforcement activities).*	
Will your research use or produce goods or information that will require export licenses in accordance with legislation on dual use items?	**NO**	Details on what goods and information used and produced in your research will need export licenses.	Copies of export licences.
Does your research affect current standards in military ethics *(e.g., global ban on weapons of mass destruction, issues of proportionality, discrimination of combatants and accountability in UAV and autonomous robotics developments, incendiary or laser weapons)?*	**NO**	Details on how the research might affect current standards in military ethics. Details on measures you intend to apply to avoid negative implications on military ethics standards (including training of researchers).	

Table 3 – dual use 'Ethics Issue Checklist'.

The table below complies exactly with the H2020 template regarding the misuse 'Ethics Issue Checklist'.

MISUSE	Yes or No	Information to be provided	Documents to be provided/kept on file
Does your research have a potential for misuse of research results?	**NO**	*Risk-assessment.* *+* *Details of the applicable legal requirements. Details of the measures we plan to take to prevent misuse.*	*Copies of authorizations, security clearances and ethics approvals (if applicable)*

Table 4 – misuse 'Ethics Issue Checklist'.