7. Responsible research and peaceful life

Emilya Titanyan·
National Bureau of Expertise, National Academy of Science of the Republic of Armenia
emilia.titanyan@mail.ru

Maria J. Espona
Targeted Initiative on CBRN Export Control Project manager (ISTC), Director of Argentina Information Quality
espona@istc.int, mariaespona@argiq.com.ar

"Dual-Use in the context of science describes the potential of knowledge or technologies to be used by third parties with benevolent and malevolent intention."
(European Commission, 2018)

7.1. Abstract

Export control includes sets of measures ensuring the regulatory implementation of the procedure for carrying out foreign economic activity, including "sensitive" products and technology. Some difficulties arise during the export control of intangible technology, i.e. knowledge related to controlled goods and technologies. The development of global computer networks has made it easier to exchange goods and information. The widespread use of low-cost computers and communication devices increases the flow of information transmitted, the control of which poses the most severe problems in export control, especially intangible assets. In this context, universities and research institutes are so-called frontmen, as universities and research institutes are open for new collaborations, new research projects, sharing information with other stakeholders, and student exchange programmes. However, at the same time, they have been targeted by illicit technology transfer efforts from threat actors, and each time theft or problematic transfer takes place, it places the university at risk and endangers the host nation's security. Dual-use dilemmas come out when the same result of the research can be used “dual”: for peaceful aims or military ones. Basic research, as well as more applied technologies, fall within the

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category of dual-use. Therefore, the topic of technology control mechanisms in research settings is rising on government agendas worldwide.

Keywords*: intangible technology transfer, research institutes, scientists, weapons of mass destruction, awareness, dual-use*

7.2. Current situation

On December 13, 2018, within the framework of the 2018 Export Control Forum of the European Commission, the legislative processes of trade control taking place in EU member states, the directions of effective cooperation between public, scientific and industrial spheres of each state in this field were discussed. As a result, it became clear that the most effective mechanisms for trade control shall operate at the national level as the main guarantee for security assurance. In other words, domestic legal regulations on strategic trade control and its effective application are among the pillars of domestic, interstate and international security. Export control is a set of measures ensuring the regulatory implementation of the procedure for carrying out foreign economic activity, including "sensitive" products and technology and dual-use items. The concept of dual-use refers to the misuse of civilian technology for military purposes. In this context, it is essential to understand that basic research is more than anything else applied technologies fall within the category of dual-use.

In the age of scientific and technological globalisation, when such projects as "scientists without borders" are more than relevant and welcome, interstate research projects are encouraged and funded, controlling "sensitive", and dual-use products and technologies is almost not regulated. Transferring intangible or sensitive items concerns so institutes, students, researchers as scientific and technical cooperation, which includes:

- distribution of scientific and technical information through scientific, technical and educational literature, reference books and reviews, technical standards and instructions, patent descriptions, conference materials, certain types of technical documentation;
- joint research projects and sharing of results;
- training in higher education, student exchanges and internships for young scientists and specialists;

- exchange of information during international scientific conferences and symposia; exchange of information during specialised international exhibitions, among others.

The export control of the intangible technology, i.e. knowledge related to controlled goods and technologies, difficulties arise, as the development of global computer networks has made it easier to exchange goods and information, and the widespread use increases the flow of information, the control of which poses the most severe problems in export control. Currently, in this segment of export control, the issue is what to control and how to control it and how to balance the free exchange of research results with security concerns.

There are some attempts to publish open articles on fundamental research, while these studies are not as such. Delicate questions also arise when teaching sensitive specialities to international students, and a need to restrict the publication of textbooks on sensitive specialities because unclear regulations in this area cause an uncertain landscape and a grey area for those involved in teaching.

In the current situation, due to the lack of clear criteria and in order to avoid the "unconscious" transfer of possible dual-use information, the government mainly uses the practice of total control, which causes frequent misunderstandings and discontent of the scientific community, which is forced to limit its communication.

It is undeniable that research and military developments overlap in many areas of science - fundamental and applied. Some information considered secret in one country is published in open sources in another country. Although the "fundamental research" is defined in the Lists[33] quite unambiguously, nevertheless, there are attempts to publish open articles on fundamental research, while these studies are not as such (sometimes this is done to avoid the stage of obtaining a licence, and sometimes because of lack of awareness of whether the research is fundamental or not). Also, the control procedures for obtaining an education in the field of science that relates to the creation of weapons of mass destruction (WMD) are not regulated. Delicate questions also arise: should it be prohibited to teach sensitive specialities to international students? Moreover, is there a need to restrict the publication of textbooks on sensitive specialities because if teaching international students is prohibited at several technical universities? Consequently, they will study illegally, or

[33] Dual-use control list, more- https://trade.ec.europa.eu/doclib/docs/2020/december/tradoc_159198.pdf

the teaching staff of technical universities will look for "work on the side", creating an uncontrolled "brain drain."

Thus, the lack of precise criteria and developed provisions and low efficiency of the control of intangible technology transfer make many experts and governments of world-leading states improve this type of export control. However, the lack of a perfect system does not imply there should be no legal and technical restrictions on transferring sensitive technologies. So nowadays, one of the best ways to solve some of the mentioned problems is raising awareness among the target groups involved in the seminars.

It is evident that all this is connected and intersects with universities and research institutes, which are welcoming environments for open inquiry and advancing knowledge for the greater good, but they are also hosting to a range of sensitive technologies and knowledge of interest to foreign governments for WMD and military purposes.

7.3. Project: Responsible conduct of research: STEM scientist and peaceful life

Protecting the scientific community has become one of the main challenges of our time. Under the International Science and Technology Center (ISTC) and with the financial support of the EU, the "National Bureau of Expertise" State Non-Profit Organisation has started the research work about the responsible research for the students, researchers and scientists, universities, research institutes. This proposal's main objective is to raise awareness of stakeholders and create a more "responsible and safe" environment for the scientific community, a sustainable foundation for further legislative progress.

The project has specific stakeholders: students, lecturers, researchers and scientists, universities, research institutes. Furthermore, the precise aims are: to raise awareness, create a more "responsible and safe" environment for the scientific community and prepare a sustainable foundation for further legislative progress. So the significant impacts of this project are awareness, understanding of the ITT risks and sustainability of the results. Therefore outreach to the scientific community and awareness-raising within the community is critical to the proper implementation of any technology control. This is widely recognised and frequently demanded; however, sustained outreach and awareness-raising activity are rare.

The seminars have been held with two categories of participants: researchers from scientific research institutes of the National Academy of Sciences of the Republic of Armenia (RA) and students from leading universities of the RA, including masters, PhD applicants, and lecturers.

It is planned to involve scientists from 24 scientific research institutes of the National Academy of Sciences of the Republic of Armenia (at least ten scientists in each group). Also, we are planning to involve masters, PhD applicants, and lecturers from six universities. For each group it is planned to have two seminars /4 academic hours/ about the following topics:

- *The meaning, essence, and significance of sensitive products, technologies* և *information, including dual-use products and technologies for the scientific community;*
- *How can the misuse of sensitive products, technologies and information be dangerous and destabilising in the field of WMD? Threats and risks for the scientific community, universities and research institutes;*
- *Why does the scientific community need this knowledge? Discussion of practical case. Rules of domestic and international conduct;*
- *How to find balance? Benefits and risks in the context of global best practice analysis;*
- *What is the Internal Compliance Programme? How will this help to make it happen?*
- *Implementation of risk management: Red flags and vetting. (only for the lecturers);*
- *How and Why does the international community seek to prevent the proliferation of WMD:*
    - *International export control regimes;*
    - *UN Security Council Resolution 1540;*
    - *International agreements, organisations prohibiting the use of nuclear, chemical, biological;*
    - *Efforts to strengthen the global system of control of dual-use goods at the international (EU, US) and national level (RA);*
    - *Problems of export control in the EEU environment, Russia's experience; and*

- *The commitments of the Republic of Armenia: the legislative field, current situation, plans, the experience, the international cooperation.*

To assess the effectiveness of the results of the seminars, the working group prepared several questionnaires that have been handed over to the seminar participants with a request to fill them in before the start of the seminar and after the end of the seminar. Questionnaires consist of such questions as

-“Have you ever hard about intangible technology transfer or Internal Compliance Programme in University?”;

-"What do you think about this seminar?"; and

-“How can you describe the meaning of intangible technology transfer?”.

Using the comparative method, a working group will compare all answers to have a “picture” before and after.

To provide the project's sustainability, it is planned to provide materials and tasks, seminars videos. Furthermore, participants are provided with the opportunity to publish their works in export control, ITT, ICP, trade control for free in the "Armenian Journal of Forensic Expertise and Criminalistics" of the National Bureau of Expertises where it is planned to create a separate section for this field. It is worth mentioning that this journal is a scientific publication, which will contribute to publishing the works conducted by students. Thus, sustainability of the process of education of this field will be ensured by the contacts with governmental bodies, particularly, with the Ministry of Economy and Ministry of Science and Education of RA, and also by step by step implementation lessons about these topics in the leading higher educational institutions of the Republic of Armenia.

7.4. Conclusions

On 1st December 2021 the working group finished seminars with the Group of students and with the group of lecturers. Although all participants answered that they had heard nothing about ITT, dual-use items, ICP in their universities, 70 per cent answered this knowledge is essential for them. These results show the need to implement a project like this one to cope with the scientific community's needs.

Considering the survey results, we are planning to:

- Generate interest in technology control frameworks and promote understanding of the broader legislative backdrop and its application in research settings.
- Raise awareness of the proliferation threat environment and pathways illicit actors seek to use to gain illicit access to strategic technologies in research settings.
- Advance understanding of the risks students, researchers and scientists face resulting from illicit technology transfers.
- Develop knowledge of how to implement risk management strategies in the scientific field.

7.5. Ethics

Data accessibility. No data was recorded for the production of this review article.

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7.6. References

1. Quentin Michel, Lia Caponetti. Introduction To International Strategic Trade Control Regimes, 2017.
2. Quentin Michel, Christos Charatsis, Lia Caponetti, Sylvain Paile-Calvo, Emanuela Marrone. Do Academic Activities Contribute To WMD Proliferation? 2018.
3. Quentin Michel, Wolfgang Lehofer (Eds.). Incentives Of Europe For Non-Proliferation Outreach Activities, 2017.
4. Managing risks in Internationalisation: Security related issues Managing risks in Internationalisation: Security related issues (universitiesuk.ac.uk)
5. Export Control in Science & Research BAFA - Export Control and Academia
6. Export Control and Academia Manual BAFA - Export Control and Academia