Part C: Implementing Compliance Measures in Practice

8. Tailoring ICPs to the Needs of Research Organisations: the Case of the European Commission Joint Research Centre

This chapter suggests how the risk identification process can take place in practice so as to design compliance measures tailored to research organisations. The intent is to use the Joint Research Centre as a test case for elaborating and completing a model risk assessment to be applied in the initial phase of development of an ICP. As section 6.3 suggests such a risk assessment can be considered as a necessary condition for implementing effective compliance mechanisms. The Joint Research Centre is a European Commission Directorate General (DG) having a distinct role compared to all others. Its primary objective is to conduct research with a view to backing the EU policy making. This way the JRC does not only provide independent scientific and technical input to the other DGs but also has an impact on innovative research carried out in a variety of fields from nuclear security to safety standards and from environmental research to cyber security. From its foundation under Article 8 of the EURATOM Treaty as the Joint Nuclear Research Centre in 1958 till today's multidisciplinary research work, many things have changed except this: the JRC's contribution to the nuclear safety and security in Europe and beyond[455].

> As the Commission's in-house science service, the Joint Research Centre's mission is to provide EU policies with independent, evidence-based scientific and technical support throughout the whole policy cycle. Working in close cooperation with policy Directorates-General, the JRC addresses key societal challenges while stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners.
>
> *JRC Mission Statement*[456]

Today, the organigram of the JRC comprises seven research Directorates, three Directorates coordinating the overall operation of the JRC plus the Board of Governors and the assistants to the Director General[457]. The three policy support Directorates are the following: **A. Policy**

[455] "After consulting the Scientific and Technical Committee, the Commission shall establish a Joint Nuclear Research Centre. This Centre shall ensure that the research programmes and other tasks assigned to it by the Commission are carried out. It shall also ensure that a uniform nuclear terminology and a standard system of measurements are established. It shall set up a central bureau for nuclear measurements". See Article 8 §1 of the Treaty Establishing the European Atomic Energy Community (also known as EURATOM or EACC) as of March 2010, retrieved from: http://europa.eu/eu-law/decision-making/treaties/pdf/consolidated_version_of_the_treaty_establishing_the_european_atomic_energy_community/consolidated_version_of_the_treaty_establishing_the_european_atomic_energy_community_en.pdf.

[456] 'JRC in brief' from the JRC's Science Hub website, retrieved from: https://ec.europa.eu/jrc/en/about.

[457] The JRC has recently undertaken (April 2016) a major reorganization with a view to streamlining and modernising its model of governance. For instance, all the nuclear related Units will come under

Support Coordination, B. Resources and C. Ispra Site Management. The seven research institutes are listed below (the numbering follows the organigram of the JRC):

D. The Institute for Reference Materials and Measurements (IRMM) develops advanced measurement standards and provides state-of-the-art scientific advice concerning measurements and standards for EU policies.

E. The Institute for Transuranium Elements (ITU) contributes to an effective safety and safeguards system for the nuclear fuel cycle. It also undertakes research associated with technological and medical applications of radionuclides/actinides.

F. The Institute for Energy and Transport (IET) seeks to ensure sustainable, safe, secure and efficient energy production, distribution and use and, it fosters sustainable and efficient transport in Europe.

G. The Institute for the Protection and Security of the Citizen (IPSC) contributes to a variety of EU policies ranging from global stability and crisis management to maritime security and fisheries management and from the protection of critical infrastructures to digital security. The IPSC performs also statistics and information analysis for the evaluation of the effectiveness of policies and to enhance financial stability.

H. The Institute for Environment and Sustainability (IES) conducts research concerning the protection of the environment promoting thereby the efficient and sustainable management of natural resources at global and continental scale.

I. The Institute for Health and Consumer Protection (IHCP) undertakes research in the areas of food, consumer products, chemicals and public health by contributing to the set and harmonisation of safety standards.

J. The Institute for Prospective Technological Studies (IPTS) provides science-based evidence concerning the socio-economic, scientific and technological impact of certain EU policies.

The JRC employs over 3000 people coming from throughout the EU and bringing their skills and talents to work on scientific activities meant to underpin the EU policy-making process. About two thirds of the staff are scientists or work on scientific projects, 21% carry out administrative or support activities and 2% work in nuclear decommissioning and waste management.

The JRC budget is made up by funds from the EU's framework programme for research and innovation, Horizon 2020, for its non-nuclear work and by the EURATOM Research and Training Programme for its nuclear work. Further income is generated by the JRC through additional work for Commission services, and contract work for third parties such as regional authorities and industry. In practical terms, one may distinguish between ‘institutional’ projects funded directly by the H2020 and the EURATOM budget and ‘competitive’ ones

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the roof of one Institute. Yet, the main areas of work and competence will remain as described in the doctoral study.

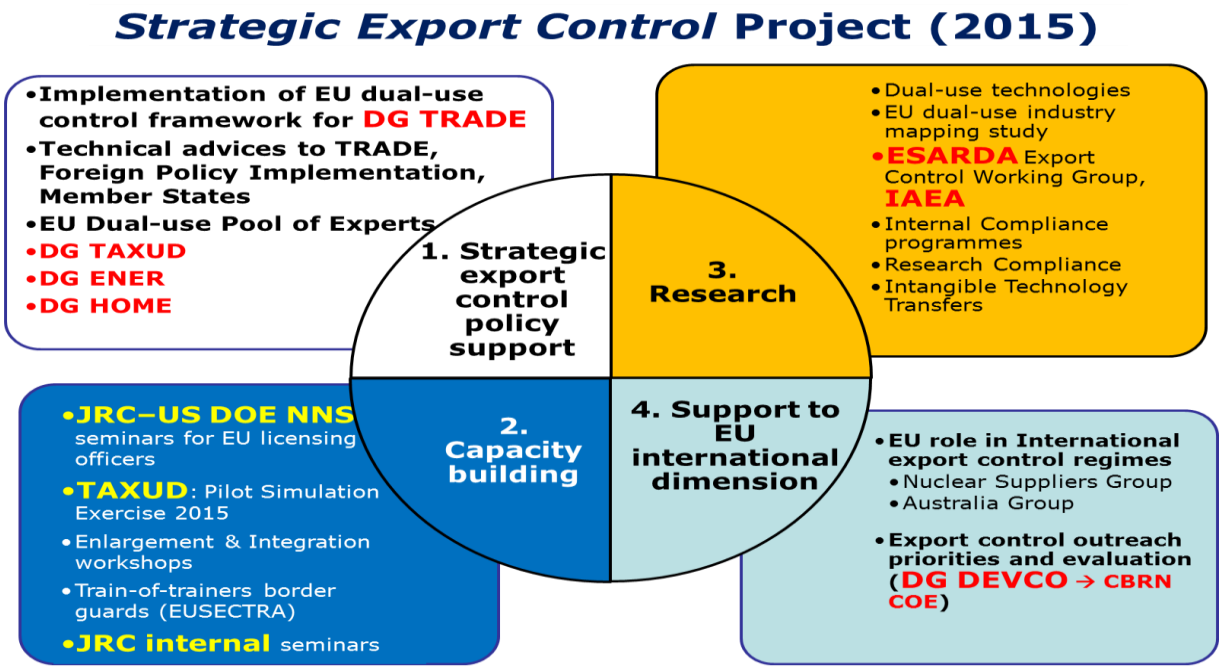
funded under contracts with other Commissions DGs, research organisations, governments and firms.

Table X: The Joint Research Centre in a nutshell

The Joint Research Centre in a nutshell *(2014 figures)*	
N° of JRC sites	5 plus the Headquarters and Directorates in Brussels
Scope of research activities and policy support:	1. Economic and Monetary Policy 2. ICT and Cyber Security 3. Energy and Transport 4. Environment and Climate, 5. Agriculture and Global Food Security 6. Disaster Risk Reduction 7. Health and Consumer Protection, 8. Nuclear Safety and Security 9. Nuclear Decommissioning
N° of employees:	3,055 of which 77% work on scientific projects
Temporary staff (contractual agents, grant-holders, SNEs, trainees)	About 40% of the staff
Budget:	€374 million
JRC revenue (indirect actions for Commission services and contracts with third parties):	€72,8 million
N° of publications:	689 books and articles in peer reviewed periodicals
N° of patents granted:	21

8.1 The dual role of the JRC *vis-à-vis* export controls

As F. Sevini has noted, the JRC has a special role to play in respect of trade controls, a role of 'dual nature'[458]. The organisation is a provider of expertise for the 'dual-use' policy making as well as a holder and potential exporter of controlled technology. The Strategic Export Control team was established in 2009 by the Nuclear Security Unit (NSU) and it is the most indicative example of the mutli-disciplinary support provided by the JRC in the area of trade controls. STREX competence concern four main areas: policy support; capacity building; research and, EU outreach.



For instance, the STREX team provides ad-hoc technical and legal support to DG Trade with regards to the implementation of the dual-use regulation (*e.g.* draft of guidelines for harmonised implementation, technical studies). STREX activities include the organisation of scientific conferences (ESARDA Export Control Working Group) and trainings for licensing and customs officers coming from the EU and partner countries as well as the planning and evaluation of EU outreach activities promoting export control objectives in non-EU countries. Also, developing statistical methods and tools for estimating the impact of trade controls on economic activity as well as identifying and analysing licensing data and patterns of dual-use trade are further areas where the JRC contributes to through the project 'Strategic Trade Analysis for Non-Proliferation'.

Despite this multifaceted role of JRC support, the organisation could be more actively engaged in the policy formulation and technical back-up required in the export controls area. Trade controls have not only legal aspects to be clarified; they are also a highly technical area requiring expertise be it for understanding and drawing up the control lists or clarifying the export control implications of innovative technologies. Such expertise is widely available in

[458] Presentation by F. Sevini, C Charatsis, "Strategic Export Control Awareness and Compliance at the JRC," 7th ESARDA Export Control Working Group, December 3-4, 2015, Ispra.

the different JRC Institutes and combined with the JRC's experience in policy support could benefit the operation of the EU trade control system and the international non-proliferation system in general. Currently, apart from the regular support provided by the JRC during the deliberations of the DUCG and the DUWP, JRC scientists may participate and back the EU delegation in the meetings of international export control regimes and most notably at the NSG and the AG plenaries[459]. From a compliance point of view, the JRC is a research institution and thus, it should act in conformity with the trade control laws as any other research or exporting organisation. Indeed, as part of the European Commission, the JRC should 'lead by example' ensuring that research conducted in its premises meets strict safety and security standards including trade control requirements. On top of this, third-party due diligence should be shown with regards to tasks funded or carried out by the JRC in collaboration with other organisations.

For this doctoral study, the focus is on the role of the JRC as a research organisation that should abide by the export controls law. What are the JRC's particular characteristics having some relevance from an export compliance perspective? First of all, the identity of the JRC as an organisation conducting research in nuclear, biological and chemical fields may raise export control related questions. Dual-use trade controls concern a variety of technologies such as ICT equipment (from ultra-wideband equipment and frequency hopping radios to encryption software), electronic equipment (from neutron generators, frequency changers and mass spectrometers to optical sensors and inertial gyros), machine tools (from coating equipment and vacuum pumps to melting furnaces and isostatic presses) let alone hazardous materials such as natural and depleted uranium, pathogenic agents and chemical precursors. Many of these materials, related software and technologies are used or most rarely developed by the JRC's institutes for research purposes. Therefore, one could ask whether such items are being exported to destinations abroad and also, who is able to access sensitive technical data and equipment used or developed during JRC research.

Second, Article 8 of the EURATOM Treaty sets out that the activities of the Centre may, for geographical or functional reasons, be carried out in separate establishments. This is a long standing characteristic of the JRC. The bulk of its research activity takes place in Ispra (Italy) but research institutes have been established also in Belgium (Geel), Germany (Karlsruhe), Netherlands (Petten) and Spain (Seville). At the same time, the headquarters including also the central Policy Support Coordination and Resources Directorates are located in Brussels. This dispersion of research and supporting activities albeit limited to the EU territory may pose further challenges from an export control standpoint. Also, in executing its research programme, the JRC works with about 1000 partners worldwide. Even though the majority of its partners are EU based, the JRC maintains over 200 international cooperation agreements with partners in Africa, North and Latin America -including Caribbean- Asia and Eastern

[459] The EU is a founding member of the Australia Group; the Commission has the status of observer in the Nuclear Suppliers Group while there is no official role of the EU in the Wassenaar Arrangement and the Missile Technology Control Regime (MTCR).

Europe[460]. Furthermore, the JRC welcomes a large number of visitors in its premises each year for conferences, collaboration activities and trainings.

Third, contrary to much more developed institutional policies and procedures for safety and security implemented by the JRC, similar attention has not been fully drawn to export compliance. The JRC lacks of a formal comprehensive export compliance system. The main internal compliance practice followed is the conduct of awareness raising seminars in selected institutes. That said, in a period of two years three such seminars took place one in the Nuclear Decommissioning Unit (Ispra), one in ITU (Karlsruhe) and one in IHCP (Ispra) on the initiative of the Nuclear Security Unit and the STREX team. Basic export compliance rules and procedures exist mainly for those institutes undertaking nuclear related research and most notably the ITU. Actually, the ITU took some concrete steps for introducing export compliance procedures back in 2014, following communications from the German licensing authority on possible ITT issues and preventive measures. In any case, nuclear scientists are more accustomed and receptive to security controls compared to their colleagues in other fields where the relevance of dual-use trade controls is less evident. That said, as a result of awareness raising efforts, scientists also from other fields contact STREX for advice on export control issues pertaining potentially to their work.

8.2 Applying the risk identification method in the JRC setting

Developing an export compliance strategy requires taking those steps described in the first phase of the 'Plan-Do-Check-Act' cycle. The objective is to elaborate and test the basic method suggested in section 6.3 with the aim to identify export control risks in the context of a research organisation. In addition, further intrinsic characteristics impacting potentially the institutional identity and thus, the compliance strategy of the organisation should not be missed out. The perception of employees towards compliance in general, the commitment of the senior management to compliance in the running of the organisation as well as the level of awareness of export control issues are such supplementary factors to consider in the phase of the 'inception' of an export compliance system. The culture permeating the relations between the employees of an organisation is another aspect to consider albeit not easily quantifiable.

To begin with, the ISO 19600 standard sets that "the organisation should identify compliance risks by relating its compliance obligations to its activities, products, services and relevant aspects of its operation". Following this, compliance risks should be analysed "by considering causes and sources of non-compliance, the severity of their consequences, as well as the likelihood that non-compliance and associated consequences can occur". This approach is in alignment with what chapter 6.3 suggests. Building on that suggestion, one could single out three main steps to be taken at the phase of inception and planning of an export compliance system:

[460] Information retrieved from JRC official webpage, "Working with us", available in: https://ec.europa.eu/jrc/en/working-with-us.

I. explore the export control requirements that the organisation has to or voluntarily commits itself to comply with;

II. identify potentially sensitive research activities undertaken by the organisation;

III. assess the institutional policies and procedures of the organisation as well as any other specific aspects (*e.g.* culture) having some bearing for export controls.

Establishing a comprehensive compliance system from scratch is not an easy task. One should start by evaluating the risks stemming from the specific identity, activities and external environment of an organisation prior to designing a compliance strategy. The ultimate goal would be the establishment and implementation of an efficient and effective export compliance management system well-integrated in the structure of a given organisation. For this study, the main intent is to explore what is the initial process for identifying areas of risk and designing a compliance system fitted to the needs of a research organisation. This process could be considered of utmost importance since it allows the verification of possible risks and the implementation of mitigating measures. The JRC as a public cross-border organisation conducting research in a variety of disciplines constitutes a relevant case study for reasons explained above. In other words, this exercise can be seen as a feasibility study aimed at providing an insight into possible challenges and options for designing an internal control system tailored to the risk profile and the needs of the JRC.

8.2.1 Introductory remarks

I. The Regulatory framework: As a research establishment, the JRC is subject to the specific rules applying in the respective national jurisdictions where its different institutes operate. This is valid for export control and other safety and security obligations. The EU regulatory landscape on export controls was presented in chapter 4. Although the dual-regulation sets the foundations and the main principles of a common trade control system, the implementation and actual enforcement of trade control provisions is conferred to national authorities that have also the discretion to take additional national measures and laws. To complicate the situation further, the applicability of extraterritorial provisions of legislation adopted by other countries may be another issue to consider. As discussed earlier, complexity increases in a research setting and thus, clear guidance can be of great help to researchers striving to fulfil different compliance requirements.

II. The sensitivity of research: Evaluating the sensitivity of the research undertaken by a research organisation requires taking into account first, whether controlled materials, equipment, technologies and software are being used or developed in a laboratory and second, if such goods are shared with non-EU nationals or transferred abroad. This way one could correlate the sensitivity of research per se with the amount of foreign involvement so as to identify an export control risk. An unpredictable outcome of a research activity may also pose a risk to the extent that it relates to a controlled item or has high potential to be misused due to ethical or other concerns. Evaluating each and every project of the JRC can be too cumbersome and besides this, the results of research can be frequently unpredictable. This is also why certain measures such as awareness raising seminars and trainings aimed at creating

a culture of responsibility are necessary steps to consider in the framework of a compliance system. It follows that identifying potentially sensitive projects in the work programme of the JRC and, asking from the responsible scientific staff to clarify both the technical parameters and the amount of international participation involved is a plausible way to proceed.

III. The export related processes: Generally speaking, the organisational structure and the values shaping the culture of an organisation are unique elements determining the identity of an organisation. Figuring out how an organisation is structured as well as identifying processes relating to export controls is an important parameter to consider prior to implementing an ICP. For instance, a good question to ask is whether the JRC implements a centralised model of governance or not. Despite the allocation of the research portfolio to different institutes and locations, central coordination is exercised by the policy support Directorates and the Director General according to the main policies and rules set by the competent EC DGs and services. Most importantly, the way that certain policies and procedures function may pose a risk and therefore, assessing such procedures against export control objectives is a necessary action to take. Proposals for tackling risks and integrating export control objectives to existing processes could be the outcome of such assessment. Studying the practices followed by the JRC and interviewing the staff involved in the operation of export related processed is the way to proceed for accomplishing this step.

Following the method suggested above, sections 8.2.2 to 8.2.4 intend to show how risk identification can take place in practice by applying the main steps in the JRC context. The Nuclear Security and the Chemical Assessment and Testing Units were chosen for testing the method described above. Each unit represents distinct areas of research namely nuclear and chemical and both Units have been exposed -although with varying success- to export control objectives thanks to awareness raising initiatives undertaken during the past years by STREX. Also, both Units were quite accommodating in furthering the purposes of this study. The first step is to assess the sensitivity of research -determined by both the nature and the scope of such activities- bearing always in mind the legal requirements set in the trade control law. The second step is to explore what institutional processes are already in place for dealing with 'export' related issues. Whereas the sensitivity of research may differ for each Unit, the institutional procedures being applied must be largely common for both. Presumably at the end of the process, one would be able to answer what sort of risk mitigation measures need to be established and through what institutional processes and mechanisms.

8.2.2 Determining the sensitivity of research

With a view to identifying sensitive research activities, the author relied on the JRC web-based 'project browser' listing the active work packages including their defining parameters[461]. For a targeted search, the project browser provides the option to filter by Unit, responsible officer, main DG concerned, source of funding involved and period of activity. This tool is accessible only to JRC staff and it provides *inter alia* information concerning the following aspects of every JRC work package:

[461] In the JRC jargon, the term 'project' is used to describe work packages including both institutional direct actions and competitive activities.

- the general description
- the key orientation and main policy area to which a work package relates
- main funding DG and types of collaboration involved (*e.g.* competitive or institutional)
- the stakeholders involved (European Commission DGs plus external beneficiaries)
- the type of activities involved (*e.g.* instrumentation and hardware, monitoring, verification and surveillance, methods and testing, education and training)
- the main deliverables (including published reports and articles)

It comes out that the project browser provides a good source of information for evaluating the sensitivity of the research portfolio. Such a task demands to draw on expertise of the responsible researchers and officers in order to understand in the first place what technology, equipment and materials a given project entails and contend whether an export risk is relevant. Nonetheless, the project browser does not provide all the details that could be useful for performing a complete risk assessment. For instance, information concerning procurement or exporting activities and other third parties involved in the execution of a research project is not mentioned.

A. The Nuclear Security Unit (NSU)

The NSU undertakes research in areas such as non-destructive analysis of nuclear materials, development of technologies for monitoring, containment and surveillance of nuclear activities, verification and detection technologies, analysis of open-source information and satellite imagery in support of the implementation of non-proliferation treaties and safeguards agreements and of course, research on trade control issues. Such activities include the provision of technology, instruments, technical services and training to inspection agencies, States and operators. In addition, the Unit operates the European environmental radioactivity emergency notification and information exchange systems[462]. In practice, the research portfolio of the NSU could be divided into four thematic areas -closely intertwined each other- plus limited activities in nuclear waste management and decommissioning:

1. Detection for nuclear security
2. Implementation of safeguards agreements
3. Other actions supporting non-proliferation objectives
4. Environmental monitoring and emergency preparedness

For this case study, Dr. Paolo Peerani, a former NSU scientist and presently Head of Unit (HoU) in the Nuclear Decommissioning Unit was asked to make a first classification of potentially sensitive projects taking into account both factors the nature of research per se and the international exchanges involved. The outcome was a compilation of activities presenting some interest from an export control perspective and originating from all four areas. Then,

[462] See also information provided in the NSU and JRC public websites, available in: http://npns.jrc.ec.europa.eu/structure/01-structure.htm; https://ec.europa.eu/jrc/en/about/institutes-and-directorates/jrc-itu/organisation.

the responsible scientists, the so-called 'project leaders' were asked to provide their perception and clarify the potential export control risks relating to their work. It turns out that projects flagged as sensitive under the first evaluation do not necessarily involve transfers of controlled items and technologies subject to an export authorisation. The detailed analysis has been made available to the management of the JRC.

B. The Chemical Assessment and Testing Unit (CAT)

The work of CAT focuses on human exposure to chemicals by providing databases, detection methods and risk analytical tools for a number of areas including consumer products, medical devices and food contact materials. Indeed, the Institute hosts the EU Reference Laboratory for Food Contact Materials. In practical terms, the laboratory seeks to offer harmonised testing methods for food packaging materials and kitchen utensils, cosmetics, and textiles. The Deputy HoU, Dr. Diana Rembges provided her insight in identifying most sensitive work-packages that could have some dual-use interest. The nature of research including equipment, material and processes used or developed in Unit's laboratories was the main criterion used for the selection. Then, the responsible 'project leaders' were interviewed with a view to clarifying potential risks and perceptions *vis-à-vis* export controls. From the preamble, it became clear that exporting items, travelling with equipment or providing trainings abroad do not represent currently a major part of the Unit's activities. In the past, transfers of controlled materials –mostly temporary exports of chemicals- were a quite common activity of the Unit. The detailed analysis has been made available to the management of the JRC.

8.2.3 Institutional processes relating to export risks

The risk identification process requires correlating the applicable legislation, the sensitivity of research -including both particularly sensitive areas of research and activities involved- and the institutional processes relating to the conduct of such research. Taking into account the different activities covered under the trade control law –tangible and intangible exports of items and technologies- as well as the possible export scenarios described in chapter 4.3, one could draw up a list with all types of activities encountered in a research setting and having some relevance to export control requirements:

- Exporting
- Contracting with international partners
- Patenting
- Publishing
- Electronic exchanges
- Hiring staff and receiving visitors
- Traveling abroad

Naturally, different types of activity are not disjointed from each other. For example, contracting with non-EU partners may involve travelling, sharing data through electronic means and even patenting innovative outcomes of research. Quite interestingly, for almost every type of activity, the JRC has in place institutional processes and specific tools that

could be adapted for accommodating and promoting export control objectives. The table below summarises the main activities potentially posing an export control risk, the institutional processes and tools relating to such activities as well as the Directorates that coordinate or set the main policies to be followed for each activity.

Table XI: Potentially controlled activities versus institutional processes

Types of activities	**JRC Institutional processes**	**Main Units concerned**
I. Exporting and importing:	- Procedures for exports/imports, dangerous goods/ donations/ withdraws *etc*. - Procedures for fissile and radioactive material/ equipment	C.3 Assets and Logistics A.4 Nuclear Safety and Security 'Comitato Materiali Fissili e Radioattivi'
II. Contracting: *- Collaborating with/ outsourcing to international partners* *- Procurement* *- Staff employment contracts*	- Approval procedures and risk assessment of projects, and legal support - Screening (early warning system), approval - Background checks and other security processes	A.5 International, Interinstitutional and Stakeholder Relations/ B.6 Legal Advice/ B.4 Budget, Accounting and Competitive Activities B.5 Finance and Procurement C.2 Safety and Security/ B.2 Human Resources
III. Patenting:	Approval procedures and advice	Unit for Intellectual Property and Technology Transfer under deputy DG
IV. Publishing:	PUBSY publication system	A.2 Planning, Evaluation and Knowledge Management
V. Electronic exchanges:	ICT security procedures	C.2 Safety and Security B.7 Information and Communication Technologies
VI. Foreign visits:	Security procedures for EU and non-EU visitors, employees etc.	C.2 Safety and Security
VII. Travels abroad:	Mission approval scheme (MIPS)	B.7 Information and Communication Technologies

In the JRC context, certain aspects are dealt with at central level by the policy support Directorates and the competent EC DGs and therefore, main policies and rules to be followed are common for every Institute. That said, the different Institutes and their Units have some leeway to implement or introduce certain procedures for meeting a given objective taking into account their needs and the specific legal requirements stemming from the national jurisdiction to which they belong. The focus for this case study is on Ispra site and more specifically on the selected Units and their respective Institutes, the Institute for Transuranium Elements (ITU) and the Institute for Health and Consumer Protection (IHCP). However, it should be noted that the ITU with all its Units except the NSU is based in Karlsruhe and hence, practices followed by the NSU in Ispra might not be indicative of the situation in Karlsruhe. The results of this exercise might point to one of the following possibilities for the state of play concerning export compliance in the JRC:

a. *unaware* (no export risk is perceived as credible)
b. *reactive* (export risks generally known and addressed when a case arises)
c. *proactive* (export risks incorporated in institutional processes and dealt with from an early stage)

Exporting and Importing: The risk identification could concern both exporting and importing aspects for two reasons: first, import procedures are handled by the same staff and departments in an organisation and second, import requirements may indirectly imply a potential risk in the case of a future export. Therefore, an internal compliance process should address both aspects. The JRC as part of the European institutions enjoys a special status including certain privileges and immunities[463]. For the Ispra site, the Italian government has promulgated a law setting the main principles governing its relations with the JRC[464]. This law incorporates and clarifies the rights and the duties of the JRC as set in the EURATOM Treaty and more specifically, the Protocol on the Privileges and Immunities (PPI). According to PPI, "the Union shall be exempt from all customs duties, prohibitions and restrictions on imports and exports in respect of articles intended for its official use"[465]. For instance, in terms of customs duties, the JRC is excluded from paying the Value Added Tax. The same applies for imports and exports restrictions in respect of the Union's publications. Article 4 of the PII clarifies also that goods imported under this status cannot be afterwards released, whether or not in return of payment, in the territory of the importing country except under conditions set by the government of that country.

[463] Pursuant to Article 343 of the TFEU and Article 191 of the 'Euratom' Treaty, the European Union and the EURATOM shall enjoy in the territories of the Member States such privileges and immunities as are necessary for the performance of their tasks.
[464] Law No 906, Official Journal of the Italian Government 212, 1960, available in: http://www.gazzettaufficiale.it/eli/id/1960/08/31/060U0906/sg;jsessionid=FLh6GOPvPXcqDYoECS9MJw__.ntc-as1-guri2a
[465] Protocol on the Privileges and Immunities of the European Union, Treaty Establishing the European Atomic Energy Community (EURATOM or EACC) as of March, 2012, 100.

> The Community shall enjoy in the territories of the Member States such privileges and immunities as are necessary for the performance of its tasks, under the conditions laid down in the Protocol on the Privileges and Immunities of the European Union.
>
> *Article 191 of the Treaty establishing the European Atomic Energy (EURATOM)*

It is probably due to this 'extraterritorial' status of the JRC that certain procedures have been established. The JRC operates its own customs affairs office that is part of the Assets and Logistics Unit (C.3). In fact, the work of this internal service is supported by a local Italian Customs Office established in the JRC site[466]. An Italian customs officer is employed permanently and he is the one who controls whether the documentation accompanying the transport of goods is correct for either domestic or international transfers. If necessary, the customs officers may proceed to physical checks and controls before the goods leave the 'JRC territory'.

The Assets and Logistics Unit handles various logistics procedures including customs documentation essential for import and export of goods and takes care of VAT exemption aspects. Simply put, every item -above a certain value- entering or leaving the JRC must be inventoried and accompanied with the required customs documentation, '*documento di transito'*, clarifying the nature and the quantity of goods[467]. The JRC customs office operates as the link between the JRC staff requiring a given transfer, the external companies taking care of the transport outside the JRC and the Italian customs controlling the lawfulness of every transaction. In practical terms, for every transfer a request has to be submitted via an online tool, the 'JRC Assets'. Indeed, each Institute has appointed a technical responsible who manages the requests for the transfer of inventoried items according to the Institute's procedures. This is the case for both the ITU and the IHCP. The applicant has to submit the inventory code and the description of the item to be transferred, the destination as well as the purpose of the transfer[468]. The applicant has to select from a long list of purposes such as calibration of an instrument, repair and performance of experiments. The application form contains also a specific entry with the heading 'other risks' where the exporter has to declare whether the requested transfer concerns dangerous goods requiring certain safety assurances (ADR procedure applies). Most of the time, requested transfers concern temporary exports and, therefore, the applicable customs procedures are followed for either domestic (MEMORANDUM) or international shipments (CARNET ATA). Also, as the interviews with project leaders showed, in certain occasions, a temporary export may end up with the sale of equipment or sample to the recipient university or organisation. All these internal procedures do not include a specific review process for exports requiring potentially an

[466] Both the JRC and the Italian customs officers were interviewed on their tasks and responsibilities.
[467] For transfers within the EU the T2 is the necessary transport document that must be issued by the customs whereas for exports outside the Union the T1 is issued by the central customs office.
[468] All JRC assets exceeding a certain value (>420 Euros), from office furniture and ICT stuff to laboratory equipment is inventoried under a certain code. In that regard, the procurement and logistics procedure could potentially play a role in identifying and tracking particularly sensitive goods such as dual-use equipment from the very beginning.

authorisation. In the case of a dual-use export to a non-EU destination, the responsible scientist has first to submit an application to the Ministry of Economic Development and furnish the subsequent authorisation along with any other necessary documents to the internal customs office.

For transfers of nuclear material (*e.g.* nuclear waste) and radioactive sources (*e.g.* X-ray devices) a different process applies. A request is submitted to a special committee the '*Comitato Materiali Fissili e Radioattivi'* (CMFR) ensuring compliance with the national and international rules in force (*e.g.* transport notification to the Italian Nuclear Regulatory Authority, ISPRA). To that effect, the CMFR operates special registers of nuclear material, radioactive sources and X-ray machines and deals with all notification and accountancy obligations set in the national legislation and IAEA safeguard agreements. Whereas the CMFR is in charge of authorising the acquisition, disposal, transport and handling of such equipment as well as of verifying compliance with the applicable legislation (including record keeping and trainings for holders of radioactive sources), dual-use authorisations are not included in the mandate of the Committee. During the interviews with the project leaders it came out that dismantling of laboratories and donations of equipment is a plausible issue for both the NSU and the CAT Units. Old equipment may be sold, end to a scrap yard, exchanged with new one (a discount will apply for the purchase of new equipment) or donated to a partner organisation. Again, there are certain procedures (prodecura di riforma) requiring approval by a special committee after a request signed by the technical responsible, the HoU and when necessary by the Director.

Contracting with international partners*:* As explained in the introductory section of chapter 8, JRC activities are categorised into direct actions funded under its institutional budget and competitive activities funded by other Commission DGs and external stakeholders, plus till recently indirect actions funded by the H2020. This means that, in certain cases, the JRC signs collaboration agreements with a variety of partners such as public organisations and governments, international organisations, universities and firms. The execution of such agreements may include shipment of equipment as well as provision of technical assistance, software and data to the requesting parties. From an export control perspective, a risk could be addressed during both the initial decision-making phase and all along the execution process of a given project.

Concerning the decision-making, institutional and competitive activities are proposed at Unit level and require the approval of the Institute's Director. In that regard, it is interesting that for competitive activities a risk assessment process takes place. The purpose of such risk assessment is to inform the decision-making process of any possible risks and anticipate the impacts of such risks. In practical terms, the responsible project leader has to fill in a document in which he or she identifies possible risks, related causes and controls in place. He has also to assess the likelihood that such risks will be materialised and their potential impact. The Annex to the risks assessment document provides examples of risks, impacts and mitigating/ aversion measures. The risks suggested relate *inter alia* to the JRC's independent status, public safety, third party liability, confidentiality of results and data protection and,

external license requirements such as for building a facility. Export issues are not referred to explicitly among the possible risks. The potential impacts of such risks include negative publicity, loss of trust by the JRC customers and reputational damage. The remedy measures include early reporting at the planning phase, introduction of quality/approval system and final approvals by the Director. For institutional projects, a similar risk assessment is not presently in place.

The execution of an institutional or competitive activity may involve tangible and intangible transfers of materials and technologies under subcontracting with third parties. As far as it concerns procurement, purchases of low value (>15.000 Euros) are dealt with at Unit level. For purchases above a certain threshold, the applicable procedure entails prior planning, approval at Unit level and an internal request to Unit B.5 dealing with the finance and procurement needs of the JRC. The JRC, as part of the European Commission, has to follow certain internal regulations ensuring transparency, financial accountability and certain quality management procedures.

Despite the lack of an internal compliance programme, the JRC applies approval procedures for different types of agreements concluded pursuant to its working programme. For instance, for non-monetary agreements with external organisations the workflow requires pre-approval by the Institute's Director as well as approval at central level by the International, Interinstitutional and Stakeholder Relations Unit (A. 5). Also, the Unit B.6 provides legal advice with regards to a variety of aspects that may relate to export control requirements:

- site agreements and the application of privilege and immunities;
- international collaboration and agreements with third parties in nuclear research;
- contracting and subcontracting for competitive activities and,
- procurement and contractual issues such as disclosure of information.

The Commission operates also an Early Warning System for activating a red flag about third parties that are likely to pose a threat to the financial interests of the Commission. Till today the role of B.6 has been mainly reactive to the very few export related issues that have been raised. For nuclear matters, also Unit A.4 on Nuclear Safety and Security provides coordination for nuclear related projects. As suggested in chapter 7, the extent to which different departments are aware of export control issues is a re-enforcing factor for export compliance. Should the competent staff become aware or follow training on export controls, possible issues can be identified and filtered already in the phase of planning by the policy support and scientific Directorates.

Patenting and Technology Transfers: The JRC has the right to protect and disseminate the results produced during its research activities in a fair and equitable treatment for both the Union and other parties involved. For JRC direct actions funded under the specific Framework Programme implementing the H2020, the rules described in section 4.1 for the dissemination and confidentiality of H2020 research results still apply.

The JRC should continue to generate additional resources through competitive activities, including participation in the indirect actions of Horizon 2020, third party work and, to a lesser extent, the exploitation of intellectual property[469].

Council Decision 2013/743/EU, 967

In addition to this, for nuclear activities funded under the Research and Training Programme of EURATOM, Article 12 of the EURATOM provides that[470]:

"*Member States, persons or undertakings shall have the right, on application to the Commission, to obtain non-exclusive licences under patents, provisionally protected patent rights, utility models or patent applications owned by the Community, where they are able to make effective use of the inventions covered thereby*." In relation to this, Article 24 of the EURATOM stipulates that:

"Information which the Community acquires as a result of carrying out its research programme, and the disclosure of which is liable to harm the defence interests of one or more Member States, shall be subject to a security grading system to be enacted with the adoption of a security regulation by the Council."

On the basis of these Articles and, given that Article 26 of the dual-use regulation states that the Regulation does not affect the application of the EURATOM, there is a debate over the applicability or not of export licence requirements on information owned and developed by the Commission in the execution of its EURATOM research programme. The author's interpretation is that it is indisputable that the Commission and the JRC in particular has the right to protect and make available the results of its EURATOM related research under license agreements. This is in alignment with the letter of the law and the spirit of the Treaty for furthering nuclear research in the Union. Indeed, the Commission has implemented Article 24 of the EURATOM with the adoption of regulation No 3 determining the security grading (*e.g.* top secret, secret, confidential, restricted) and the security measures that shall apply for EURATOM Classified Information (ECI)[471]. However, it is not absolutely clear whether security considerations dealt with in the framework of the dual-use regulation can be addressed through such a security grading system seeking to protect 'the defence interests of the Member States'. In any case, the JRC would be expected to comply even voluntary with a

[469] Council Decision, *Establishing the Specific Programme Implementing Horizon 2020 - The Framework Programme for Research and Innovation and Repealing Decisions 2006/971/EC, 2006/972/EC, 2006/973/EC, 2006/974/EC and 2006/975/EC*, Official Journal of the EU (L 347), 2013, 967.

[470] Article 12 clarifies also that: "The Commission shall grant such licences or sublicenses on terms to be agreed with the licensees and shall furnish all the information required for their use. These terms shall relate in particular to suitable remuneration and, where appropriate, to the right of the licensee to grant sublicenses to third parties and to the obligation to treat the information as a trade secret."

[471] Council Regulation No 3 Implementing Article 24 of the Treaty Establishing the European Atomic Energy Community, Official Journal of the EU 017, 1958, 0406 – 0416.

regulation intending to ensure that the transfer of export controlled technology is duly monitored.

Regardless of the applicability of the dual-use regulation and ensuing national legislation to EURATOM activities, for non-nuclear related activities an export control clearance would be still relevant. In that regard, the JRC Intellectual Property and Technology Transfer Office with the assistance of the Legal Advice Unit (B.6) could play an important role in applying systematic export control checks before entering into a license agreement. The JRC creates most of the IP rights of the Commission and thus, it has developed expertise in the identification, protection, and management of IP assets. Indeed, the JRC IP and Technology Transfer Office has the role of the Central Intellectual Property Service of the Commission[472].

Publishing (approval procedure under PUBSY)[473]: JRC publications be it power point presentations, technical and policy related reports or, articles contributions, monographies, articles in peer-reviewed journals, literally everything has to pass through an electronic work-flow, the so-called PUBSY authorisation process[474]. The PUBSY management system allows the screening and registration of all publications with JRC authorship. This way, the system facilitates the archive of JRC publications as well as the monitoring, evaluation and reporting of all JRC outputs.

Under the authorisation process, JRC employees have to apply through the PUBSY online tool in order to take prior approval and register any scientific work drafted during their service in the JRC[475]. In fact, JRC staff has to make a draft registration request prior to

[472] The European Commission creates, procures, acquires, and disseminates intangible assets on a regular basis, in particular copyright works such as text, sounds, videos, images, software and data. More information on the role of the JRC Intellectual Property & Technology Transfer Office can be found on the JRC public website in the following link: https://ec.europa.eu/jrc/en/research/crosscutting-activities/intellectual-property.

[473] Information dawn mainly from the PUBSY Guidelines (version February, 2016), available in Connected, the EC intranet.

[474] There categories of publications are based on the categorisation of the JRC work programme deliverables as follows:

- Scientific reports for policy-making (scientific reports feeding a policy-making process)
- Scientific outputs (*e.g.* books and monographs, article contributions, peer-reviewed articles in indexed and non-indexed Journals, PhD theses)
- Technical outputs (technical reports on: technical systems and prototypes engineered or patented by the JRC; validated methods; reference materials, databases/software and datasets)
- Material for training and JRC conferences (*e.g.* oral and poster presentations and proceedings)
- Public information documents (brochures and leaflets, newspaper articles etc.)
- External study reports (outputs of contracts produced by JRC and external entities)
- JRC working document s (*e.g.* assessment and management documents, operational review)

[475] The PUBSY management process is composed of seven main steps supported by the workflow application as below:

1. Submission by the Applicant of a request for authorisation to release an output. The request can be submitted by any JRC staff member.
2. Approval by the Applicant's Head of Unit (HoU) to release the output.
3. Validation for authorisation by the Applicant's Institute Publications Officer (IPO).

releasing any JRC output such as presentation, talk, or scientific poster in a non-EC conference. The authorisation process requires the approval of the HoU and of the Institute's Director. The Institute's Programme Officer (IPO) assists the Director with the evaluation of the applications taking also care of issues from such as applicable templates, metadata resources and registration details. The final registration is handled by the PUBSY team.

With a view to safeguarding sensitive or confidential information on the basis of Commission Decision 2001/844/EC, scientists are called to declare whether a given document should be marked as 'limited distribution' or classified as 'EU restricted' or otherwise, made accessible to everybody. JRC staff is advised not to use excessively the limited distribution marking allowing access only to the authors and those involved in the approval process for a certain period of time. Requests to access such documents are reviewed by the PUBSY team on the basis of the 'need to know principle'. In any case, documents marked as 'EU restricted' cannot be even attached to the PUBSY request[476]. The Open Access Policy (OAP), namely the free of charge online access to scientific information for any user is being currently applied by the JRC as provided also in the framework of H2020. The OAP applies from the moment that a JRC scientist decides to make available for publication the results of his or her research and therefore, it should not be seen as contradictory to EU's classification policy. The details for the dissemination and exploitation of research results are arranged normally in the contract or the grant of the given research.

Most importantly, certain outputs may be marked as 'sensitive' already at the planning phase. The ultimate responsibility for assessing the sensitivity of an output to be published lies with the Institute's Director. It is in this phase where security and export control concerns may be taken into account. In the NSU for example, such an assessment against export control implications has taken place before. Presently, in the PUBSY workflow, there is no communication to the applicants of possible export control issues relating to their work. In that regard, the Head of the Planning, Evaluation and Knowledge Management Unit (A.2) has been informed by the STREX on the possible need to address export control issues in the PUBSY workflow.

Electronic Exchanges and IT security: ICT Security in the JRC Ispra site is dealt with by Unit on Safety and Security (C.2). The Unit B.7 Information and Communication Technologies along with DG Informatics (DIGIT) set the main rules and provide the overall

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4. Authorisation by the Applicant's Director to release the output.
5. Flagging the request as ready for registration by the Applicant (the request must be flagged as ready for registration when the output has been released).
6. Validation for registration by the Applicant's IPO.
7. Registration of the output by the PUBSY Team.

The first four steps must be completed before the output can be released to a publisher or to a customer.

The last three steps must be completed as soon as the output has been published in its final version in any format and after the output has been delivered.

[476] Documents with higher level of classification (EU Confidential, EU Secret and EU Top Secret) cannot be registered to PUBSY and require certain handling under other security systems.

coordination of the local security offices in each JRC site. In this regard, the experience of ICT experts could be utilised for setting clear guidance on sharing information online that could require an export authorisation. Although the JRC as part of the EC implements enhanced security measures (*e.g.* secured e-mails and secured transferred protocols for particularly sensitive information), technical issues such as the identity of cloud providers and the locations of servers utilised may need to be re-examined in view also of export control requirements. The Ispra Local Information Security Officer has become aware of the export control problem thanks to the efforts of the STREX team. Besides, in the past he was asked to provide his insight into technical issues relating to the provision of cloud services and having some importance from an export control angle.

Security System for Visitors and Employees: The DG Human Resources and Security (HR) sets the main policies and internal procedures for the safety and security of the Commission's infrastructures and the staff using and operating such facilities and premises. In Ispra site, the Unit on Safety and Security (C.2) implements a comprehensive net of measures taking into account as much international rules as national legislation. For instance, the JRC applies access controls relying on about 200 badge readers and a zoning policy ranging from least sensitive premises (white) to most sensitive (red). In fact, the local security office is in charge of all different aspects of security from the handling of confidential information to cyber security and from the transport of hazardous material within the JRC site to security clearances for JRC employees. According to the JRC intranet, the main tasks of the JRC Security Office are as follows:

- physical protection of sites
- physical protection of nuclear installations
- stand-by-duty service at the JRC sites (24 hours/7 days)
- provision of a security clearance service
- management and storage of EU Classified Information
- briefing staff before going on mission to dangerous countries
- provision of a VIP protection service
- training of JRC staff on the applicable security provisions

From an export control perspective, the most important issue is who has access to what premises, IT systems and information. In that regard, the Security Office implements its own 'technology control plan' for employed staff and visitors through an online tool, the SECPAC. A different degree of scrutiny applies on the basis of nationality, the duration of stay in the JRC and types of access required. For instance, for Third Country Nationals (TCN) -term used in the EC jargon- the host Unit is required to ask the security office opinion. The process may involve a minimum documentation, the CV of the individual as well as his or her criminal record[477]. The outcome of the risk assessment may have an impact on the access rights granted to an employee including default IT accounts, access to internet/intranet and use of PCs. For longer stays of TCN, the Unit for Security Intelligence

[477] For data privacy reasons, all information required is exchanged through secure electronic mails.

& External Liaison in Brussels may need to be consulted as well. In practice, the opinion of the security office is required for every visitor, group of visitors or new employee. The whole process is facilitated by local supporting officers being in charge of compliance with security and safety rules applying in JRC different facilities.

Approval Scheme for Travels: JRC staff travelling anywhere in the EU or beyond with the aim of performing trainings, lectures, presentations *etc.* has to submit a request in a workflow known as the 'Mission Processing Scheme' (MIPS). Any professional travel or, 'mission' as named in the European Commission jargon, should be screened by the Paymaster Office according to procedural and financial rules and approved by the HoU and the Institute's Director. The MIPS workflow does not include specific approval procedures or guidance with regards to export controlled information possibly released during such travels.

Other Related Policies: In the JRC context, there is a variety of policies and established procedures that could benefit the functioning of an export compliance system. It has been made already reference to policies for the confidentiality and dissemination of the JRC research results. JRC polices for quality management as well as ethics and integrity standards are further examples of reinforcing policies. The JRC as integral part of the European Commission is bound to meet the Internal Commission Standards and follow the rules applying for the EU officials. To that effect, the Organisational Development Unit (B.1) has put in place an Integrated Management System (IMS) for consolidating all management systems in the JRC into one coherent framework. Risk management tools, internal and external audits, ISO certified procedures are measures implemented by the different JRC Directorates in accordance with Commission's prerequisites for enhancing the effectiveness, accountability and transparency of the organisation.

Furthermore, all JRC staff shall abide by the staff regulations including commitments on ethics and integrity[478]. Each EC DG has an 'ethical correspondent' to whom possible complaints or incidents of noncompliance can be reported. Available guidance includes rules and procedures on whistleblowing, a JRC code of conduct and other documents on scientific integrity for research fellows and grant-holders. Respecting existing policies on security and conducting research responsibly is a constant refrain in all these documents. Presumably, referring to the role of export controls in such documents and introducing an export compliance system underpinned by further management processes could be a useful initiative to take on in the future.

[478] See in particular Title II, Articles 11-26a of: EU, EURATOM, *Regulation No 1023/2013 for amending the Staff Regulations of Officials of the European Union and the Conditions of Employment of Other Servants of the European Union*, Official Journal of the EU (Law 287), 2013.

8.2.4 Preliminary conclusions of the risk assessment

The targeted risk assessment for the NSU and the CAT brought out some interesting issues that need to be highlighted.

First, correlating research activities and potential export control risks for a Unit's work programme composed of more than 40 active work-packages which in turn contain individual projects –as it is the case for the NSU- is not an easy task. Also, it should be noted that some projects are close to end or have already completed certain deliverables and new ones are about to be introduced. This is a reminder that a research programme is a dynamic structure. New projects are being initiated quite often and therefore, the risk assessment is an ongoing process. This task could be better accomplished through a systematic risk assessment in the framework of an export compliance system. In relation to this, the scientist or manager involved in the selection of 'sensitive' projects needs to have not only the full picture of the activities undertaken by the Unit but also a good understanding of export control issues. In fact, the better informed he or she is the more meaningful the selection of projects will be. Therefore, providing export control training to whoever undertakes the risk assessment process and to scientific staff can be a useful action to be taken.

Second, the initial screening and the subsequent risk assessment of work-packages was based on both criteria sensitivity of research per se and international involvement. For instance, project 666 includes provision of trainings and access to nuclear facilities (PERLA, PUNITA, AS3ML *etc.*) to external users such as students and researchers. The said project was not considered as 'sensitive' since it does not enable intangible transfers of controlled technology or direct access and use of nuclear plants and facilities by foreigners. The use of both factors can be of great benefit. The risk assessment suggested that projects involving a great amount of international collaborations such as capacity building for enhancing nuclear safety and security do not necessarily entail transfers of controlled equipment and knowledge. The reverse is also possible: particularly sensitive research for instance, on new techniques for non-destructive analysis do not necessarily involve exporting regularly such methods or items outside the EU.

Third, the beneficiaries of the research of both Units are mainly international organisations, national public authorities as well as EC DGs and EU organisations. Research commissioned by governments to research organisations is not excluded from the scope of export controls; instead it may entail certain sensitivities and non-disclosure clauses. That said, transfers requested by certain partners such as the IAEA or national customs authorities could hardly ever pose a credible export control risk. A more interesting issue to assess is whether research conducted in the framework of agreements with such public organisations includes subcontracting and collaborations with other parties especially research organisations and firms established outside the EU. However, according to the case studies, it seems that most of the time NSU and CAT research involve transfers within the EU. Exploiting the research results for commercial purposes under patents and license agreements is another activity that may allude to an export control risk and it is included in the scope of activities of the NSU.

Fourth, activities undertaken by both Units showcase that research can be 'of dual-use nature' in different ways. The research undertaken by CAT on the effects of new drugs and psychotropic substances is a telling example. The study on the effects of nuclear incidents in the framework of emergency and preparedness initiatives provides an example of a NSU research that could be misused. More broadly, data repositories, classified studies and other potentially sensitive information tools can be the outcome of research undertaken by the two Units. Also, during the interviews D. Rembges noted that whereas focusing on controlled dual-use equipment and materials commonly used in laboratories is one important parameter, exploring the dual-use potential of new methods and technologies can be equally useful. A relevant example is the use of additive manufacturing technologies for 'replicating' human tissue, a technology that has been already tested (not in the JRC).

Fifth, with regard to institutional processes, each Institute has assigned to a technical officer the task to take care of transfer requests for every item leaving the JRC in accordance with the applicable rules and procedures. For most sensitive items such as chemical agents and nuclear equipment the responsible employees are well-informed. This is owed partly to the awareness of scientists and partly to the fact that certain procedures are in place for transfers of particularly sensitive items and dangerous goods such as fissile material, radioactive sources and gas tanks pursuant to safety and security regulations at national and international level. For other dual-use items that do not fall in the aforementioned categories and may require an export authorisation, it seems that the responsibility to inform 'exporters' lies with the internal customs office and the Italian authorities. Also, certain administrative departments such as the Legal Advice Unit (B.6) and the Human Resources Units of nuclear-related Institutes have developed an attitude conducive to export control objectives owing to their previous entanglement with export control issues.

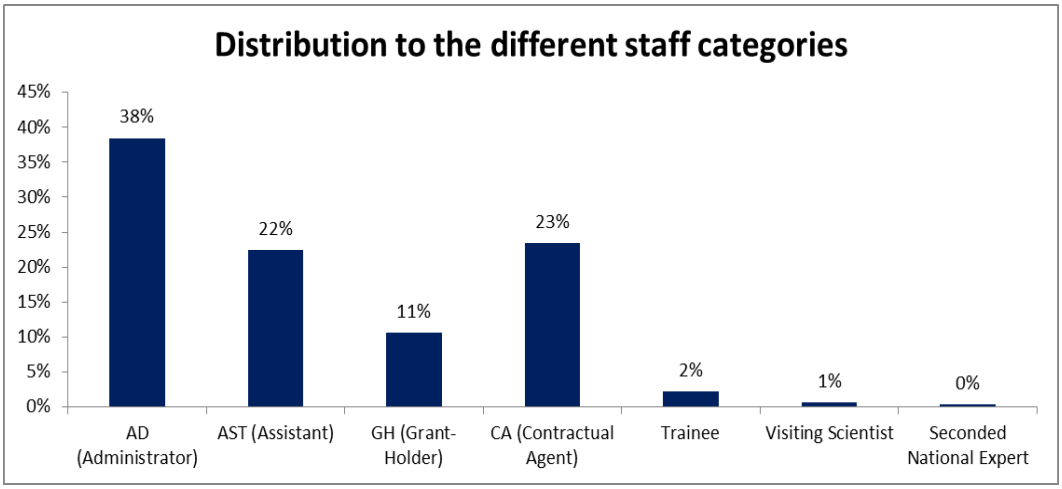
Sixth and in relation to the previous, it can be deduced that the institutional processes operated by the JRC are most of the time 'reactive' to export control risks, not 'proactive'. In the past, staff dealing with customs and legal aspects has been confronted with export control issues and thus, they have become aware of such concerns. Most of the time, staff employed in administrative posts have only a vague knowledge or understanding of the dual-use requirements and the related issues at stake. This is an expected outcome to the extent that there is no formal policy on export compliance. At the end of the day, the main responsibility of being aware of export controls and applying if necessary for an export authorisation rests with the lead scientist undertaking a given research.

Last, the NSU and CAT scientists interviewed for these case studies are aware of the existence of dual-use trade controls and the security implications of their research thanks to previous interfaces with STREX activities and their own capacity as researchers working for the EC. This is particularly true for NSU scientists because of the sensitivity of nuclear research. However, this general awareness does not imply that the Units' researchers are always in a good position to realise how export control issues might entangle in their research given also the lack of dedicated export control training.

8.3 Complementing the risk identification method

From December 9, 2015 till January 22, 2016 a JRC-wide online survey was launched with a triple aim. The first objective was to provide a broader picture of the JRC activities and the potential export control risks stemming from such activities. The second was to assess the preliminary results of the case studies discussed above against the situation illustrated in the survey and the third was to explore attitudes and the level of awareness towards security and export control matters. Statistical analysis can be seen as a supplementary tool to the more elaborate risk assessment method described above. It might further inform the risk assessment process and especially, in the case where online tools such as the JRC web-project browser are not in place it represents a useful action to take first so as to identify potential areas of risk.

The population concerned by the survey is all JRC staff (3.050 employees) working in all different sites and the responding sample represents about 10% of the total population (312 employees), statistically speaking a very good sample for making inferences about the whole population. The majority (61%) of the respondents belong to permanent staff categories (administrators and assistants) whereas temporary staff (mainly 'contractual agents' and 'grant- holders') is represented with about 37%[479].



Also, a good percentage of the respondents (18%) concerns project leaders meaning employees that are in position to have deep knowledge of the nature of research and the types of activity involved in their work. The JRC work (scientific and administrative) is supervised by more than 70 HoUs having the full view of activities undertaken in their respective Units. The survey gathered the views of 15 HoUs with regards to export control concerns.

The risk identification method described in section 8.2 relied on the JRC project browser for identifying potentially sensitive research activities in NSU and CAT. This tool can be used for mapping all JRC activities undertaken by different institutes and their constituent Units and having some interest from a dual-use angle[480]. Already the core competence of each Unit

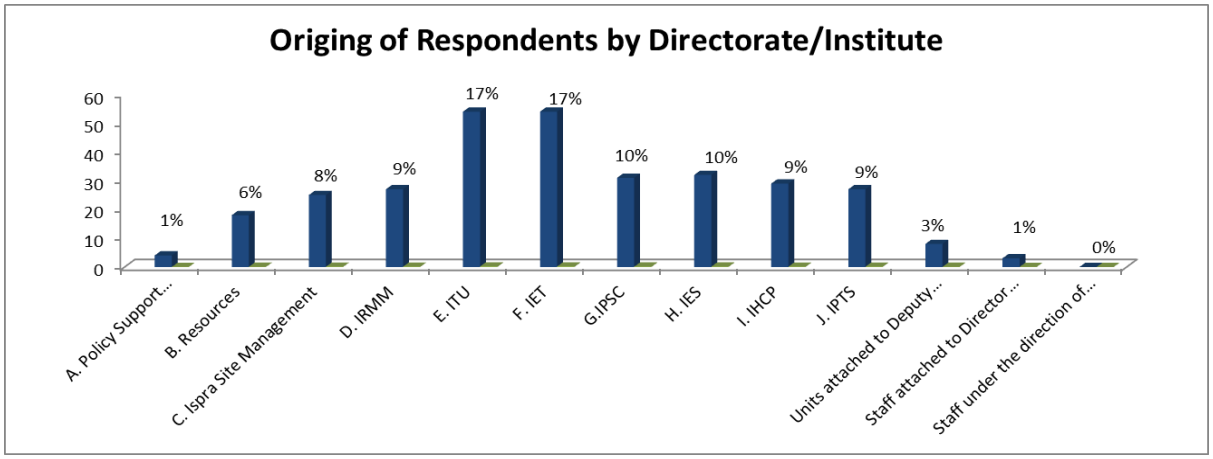
[479] About 2% of the participants did not provide an answer in that question.
[480] In fact, back in 2008, SIPRI was commissioned to assess the JRC work programme against its dual-use potential by conducting a preliminary mapping of JRC activities. This effort relied on an

(main areas of research) may hint at potentially sensitive activities. In that regard, the preliminary evaluation done for this study came up with a number of candidate Units for testing the risk identification method. For instance, one could easily suspect that a Unit developing standards for nuclear safety and security or modelling the behaviour of chemical substances under certain circumstances may have some dual-use relevance. Then, on the basis of the description of each project, most sensitive projects need to be singled out as it was done in the CAT and NSU case studies. For this study the purpose was to carry out an academic exercise and not to apply the risk identification method to all potentially sensitive Units. The whole process and particularly the selection phase of sensitive projects drew on JRC available technical expertise and officers having a global picture of the activities undertaken by the chosen Units. Reasonably, the risk assessment can be benefited by identifying scientists or managers closely involved to the activities of a selected Unit. In addition, a research organisation may need to seek assistance from the regulatory authority in order to acquire a better understanding of technologies concerned by export controls or, to use external expertise on export controls, dual-use technologies and weaponisation processes.

The scope of dual-use export controls is such that it might be necessary to engage experts having a nuclear, bio-chemical and probably an electronics related background in the risk assessment process. For example, the author opted for a nuclear and chemical research Units and hence, relied on a nuclear engineer and a chemist for the case studies. Units that were considered as relevant in the first selection, appear also in the survey among the most sensitives. However, as it was underlined oftentimes in the study, export control risks may stem from a broad area of research activities. This was also exemplified in the survey. For instance, for a non-specialist, the IES could be seen among the least sensitive Institutes. However, as the survey showed and as discussions with scientists confirmed, some IES Units may use instrumentation or technologies that are of dual-use nature and in addition, their research may demand a lot of travelling abroad for experiments and testing purposes. It turns out that the role of technical expertise is of chief importance for the risk assessment process in all phases of implementing export compliance measures. Chapter 8.3 provides an overview of the potential sensitivity of JRC activities as illustrated in the survey. The accuracy and broader applicability of the results could be checked against available JRC expertise and experience so as to draw safe conclusions for the overall sensitivity of the research portfolio. The most complete way to carry out such a task would be by implementing the risk identification method as described in chapter 8.2.

online tool that was in place at time. However, the focus was to identify areas where JRC expertise could be drawn upon to back the implementation of EU export controls. This approach is in support of the dual role of the JRC towards export controls. However, the existence of technical expertise of dual-use relevance does not necessarily imply an export control risk and today, a large number of the identified projects have been completed or suspended.

8.3.1 Identifying areas of sensitivity and expertise: a mapping exercise



The survey provides a good representation of most JRC Directorates and scientific Institutes. The role of Institutes is interesting in that they may be confronted with export control issues when conducting their research. The policy support Directorates could have a different role to play. They could act as 'gate keepers' providing administrative/legal support and catching potentially problematic transactions and activities relating to a sensitive research project.

The first section of the survey contained nine questions providing a number of examples of dual-use goods. In broad terms, these examples covered all ten categories of the Annex I of the Regulation. The participants were asked to clarify whether they use or develop any of the suggested materials and technologies for their research activities. The respondents were allowed to refer to other examples of dual-use goods falling in the suggested categories and relating to their research. The categorisation is shown in the table below[481]. Quite interestingly, with very few exemptions such as rockets, rocket propulsion systems and water tunnels all suggested options were marked by the respondents in varying percentages. Table XII collects the most 'popular' options from each category. The fact that all these different types of materials, equipment, and related software exists in the JRC laboratories, does not mean that such items fall always within the controls thresholds or that are being exported. In any case, for this fist mapping, it was deemed as necessary to have an all-encompassing picture. Already the existence of dual-use equipment is a good risk indicator for identifying Units undertaking particularly sensitive research and, having expertise that is not to be shared broadly. The specific outcomes of the survey including figures and conclusions for each Institute have been made available to the management of the JRC for further consideration.

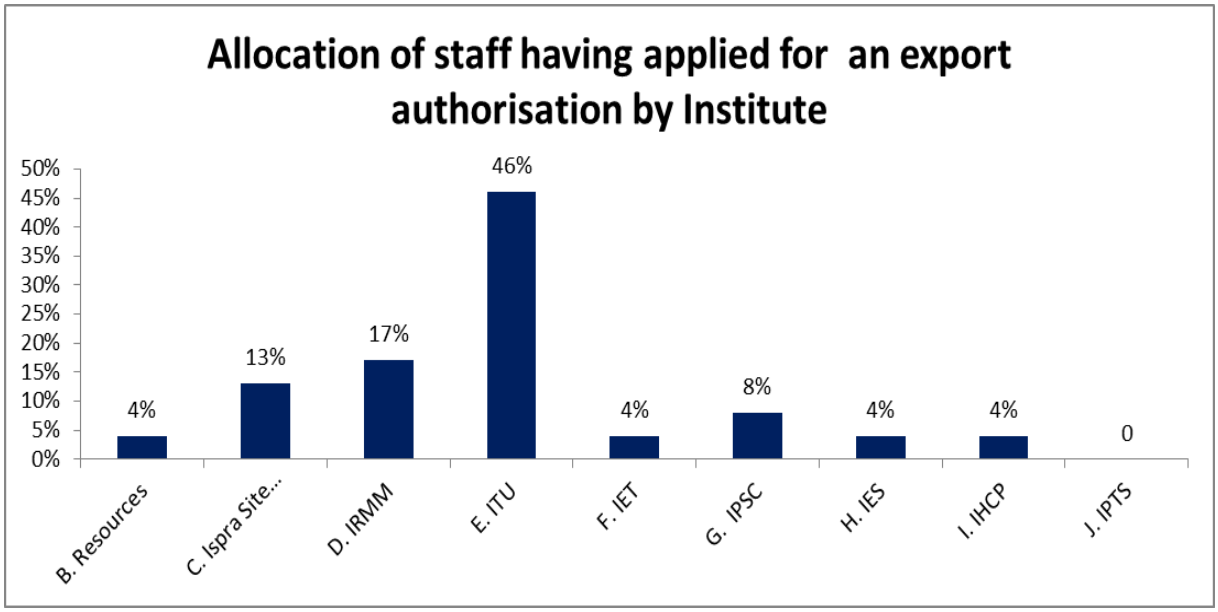
[481] Dr. F. Sevini helped the author to identify examples of materials, equipment and related technology that could be of relevance to JRC research activities.

Table XII: Categories of dual-use equipment involved in JRC research

Broad Categories		Most Selected Options
I.	Nuclear fuel cycle related material and facilities	19% replied yes
II.	Special material other than nuclear	Metals and alloys; Toxic chemicals; Graphite and ceramic materials; Composite materials; Fibrous and filamentary materials
III.	Industrial materials processing equipment	Vacuum pumps; Ovens, crucibles and melting furnaces; Pressure transducers; X-ray and ultrasonic test equipment; Environmental test chambers; Machine tools
IV.	Electronic equipment	Mass spectrometers; Signal analysers, signal generators and synthesizers; X-ray generators; Solid state switches
V.	Certain types of computer (*e.g.* ruggedized)	7% replied yes
VI.	Telecommunication equipment	Cryptographic systems, equipment and components; Cryptographic and intrusion software; Mobile phone interception or jamming equipment
VII.	Lasers/ sensors and navigation/ avionics equipment	Lasers; Pressure sensors; Thermal imaging and night vision cameras; Global Positioning Systems
VIII.	Marine and naval equipment	Pressure housings and pressure halls;
IX.	Aerospace and propulsion equipment	Unmanned Air Vehicles (*e.g.* drones flying longer than 30 minutes)

8.3.2 Transferring and exporting dual-use goods, technical data and software

The second section of the survey explored whether potentially sensitive dual-use goods are exported to non-EU countries or otherwise what 'type of exporting activities' are involved in the conduct of JRC research. Learning whether JRC scientists have been already required to apply for an export authorisation is a plausible question to ask. About 8% of the participants replied that they have applied for an export authorisation at least one time in the past. Not surprisingly, the Directorates primarily concerned are the ITU, the IRMM and the Ispra Site Management. The IPSC, the institute with dual relevance to export controls has also two entries in the survey. Finally, the IHCP and IET have from one case to refer each.



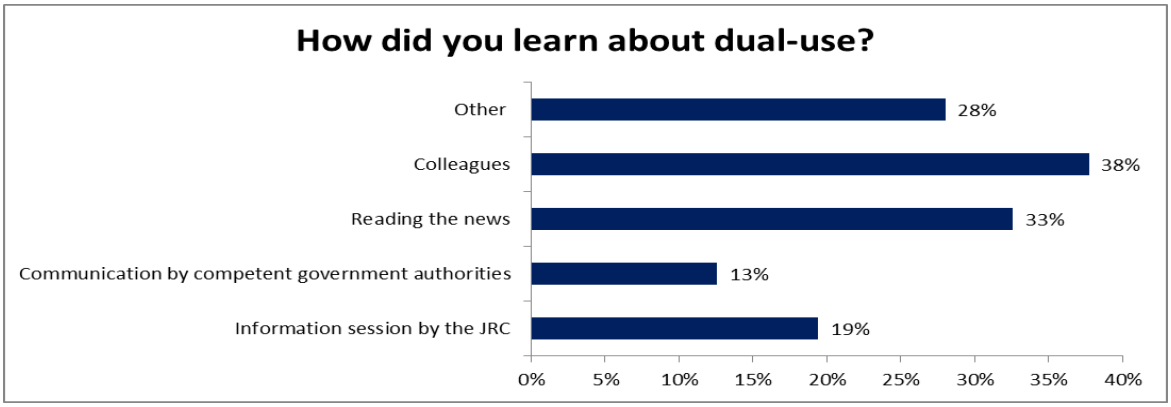
In the ITU context, past export authorisations concerned mainly transfers and exports of nuclear material and of other sensitive material such as UO2 epitaxial films to both EU and international destinations. The Institute is also an importer of dual-use materials, equipment and software. As a result end-use/end-user statements have been signed by ITU staff in several occasions. With a view to identifying further areas of concern, the participants were required to answer whether they ship potentially controlled equipment, provide technical assistance or share software and data mentioned to either EU or non-EU destinations. The first question included also dismantled or old equipment that might be sent as a donation abroad. 10% of the respondents stated that they ship such items abroad. These transfers and exports are destined mainly to the EU 28 and other countries of the European Economic Area and the US. Japan scored also quite high whereas China and Russia received very low percentages. Other destinations mentioned include Sub-Saharan countries and Mexico.

Furthermore, 9% replied that they provide technical services to both EU and non-EU destinations. Such activities concern mainly the US and Japan and to a lesser extent Russia and China. Also, partner countries from the Eastern and Southern Europe, Asia, Middle East, Africa and Latin America are recipients of technical assistance under the Instrument for Nuclear Safety Cooperation (INSC) and the CoE Initiative. Last, just 5% of the participants replied that they share technical data and software with partners abroad. Again the most part of such transfers concern exchanges with US partners, and to a lesser extent Japan and Russia. The respondents referred to Turkey, Israel, Mexico and Cuba as further recipients of technical information. The majority of the employees sharing technical data and software use e-mails and phone calls for such transfers. Also, a relatively high percentage makes software available for download in JRC web-sites.

8.3.3 Awareness and attitudes towards export compliance

The third section of the survey looked into the level of awareness and attitudes *vis-à-vis* export controls and export compliance in the JRC. The participants were called to answer whether they are aware of dual-use export controls pursuant to the EU regulation. A quite

impressive percentage of the JRC staff (49.7%) replied that they are indeed aware of the regulation and the requirement to apply for an export authorisation when transferring dual-use materials and technologies abroad. Among temporary staff, the percentage of those knowing about dual-use export controls falls to 38%.



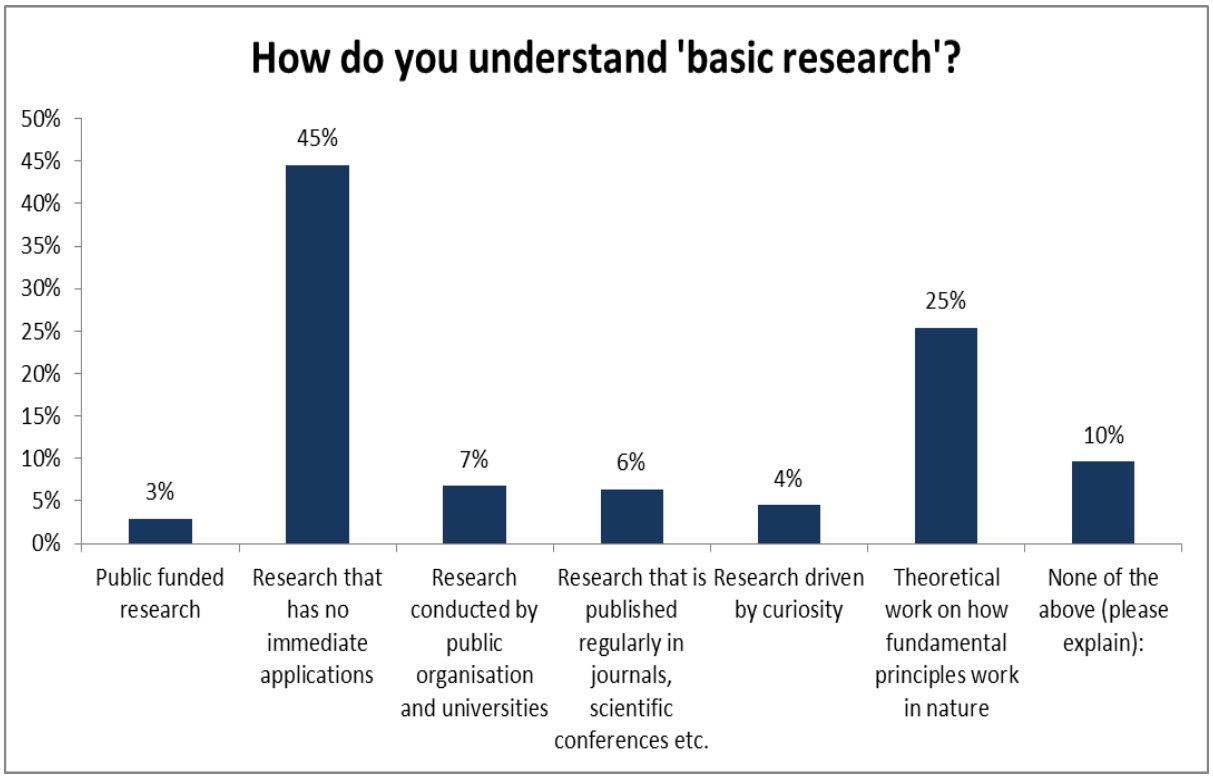
The questionnaire contained another related question exploring the level of awareness of dual-use research and dual-use goods in general. The majority of the participants (56%) responded that they were aware of the dual-use issues already before taking the survey. There are different sources whereby the JRC staff may learn about export controls. These concern mainly contacts with colleagues, reading the news as well as information sessions organised by the JRC. Also, an important percentage learned about dual-use export controls after communication by the competent government authorities[482]. Other recorded responses are 'studies on that issue', 'self-education for work purposes', 'external trainings', 'information from NGOs', and 'common sense'.

Quite interestingly, JRC employees have become aware of the dual-use problematic in many different ways including previous employment either in private or public sector (nuclear regulatory authorities or previous position in the EC). There were also responses as follows: "on my own duty, as project leader working with nuclear materials", "learning by experience (having occasionally dealt with or worked on dual-use items over 20 years)" and, "we have to specify that our services can be exported". In addition, the Legal Advice Unit (B.6) appears to take well into account export requirements, as the responses of its employees illustrate: "this is part of my duties" and "yes, I work on legal aspects of collaboration agreements". This outcome confirms the conclusion drawn in section 8.2.4, that compliance with export controls is part of the running of the organisation.

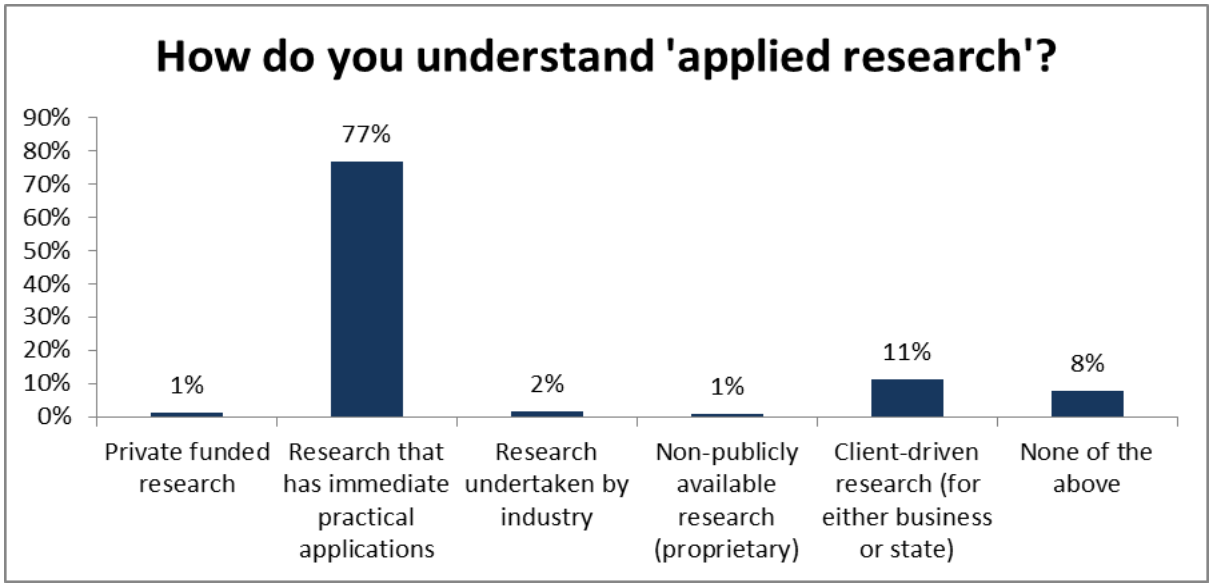
All the participants were willing to share their understanding of terms 'basic scientific research' and 'applied research' on the basis of a number of options provided. Research that has no immediate applications is the option that scored first (44%), followed by the option 'theoretical work on how fundamental principles work in nature'. Research conducted by public organisations and universities was the third most popular response followed by the

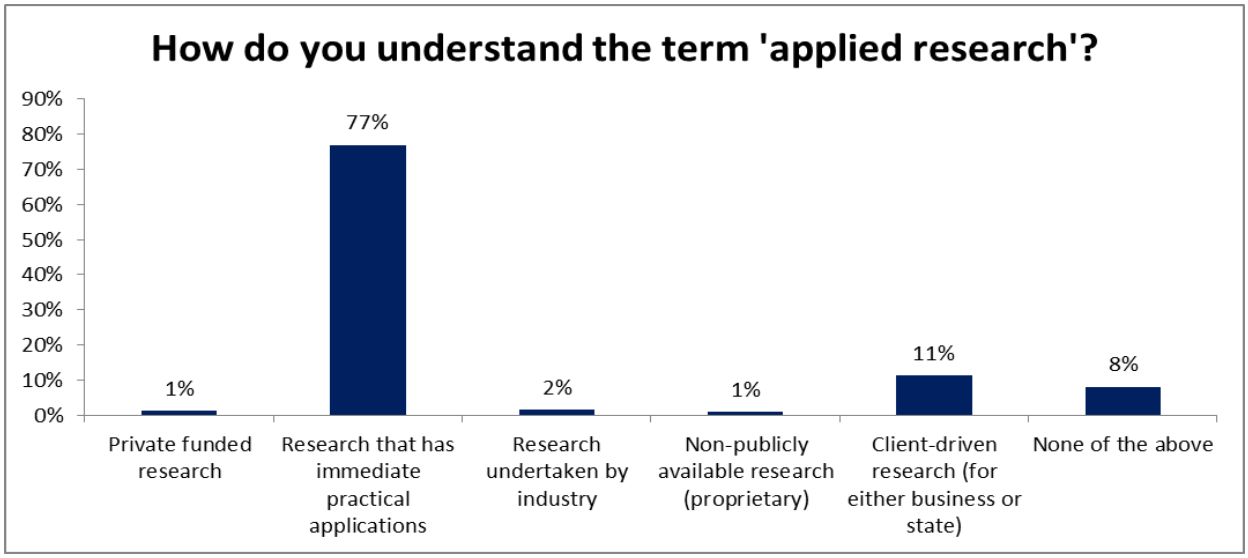
[482] The respondents had a chance to select more than one options for that question. Therefore, despite the imbalance of the specific percentages, the ranking is still indicative of the main sources of information.

criterion used by the US authorities for defining 'fundamental research' namely, 'research that is published regularly in journals, scientific conferences *etc.*



Reversely, applied research is understood primarily as research that has immediate practical applications (77%) and it can be often client-driven research (11%). The funding source was hardly referred as a defining characteristic for either basic or applied research.





Some of the free text responses provided by the JRC researchers present particular interest and point to issues already discussed in this study, most or least extensively. Some respondents stressed the difficulty to provide a widely applicable definition of the basic research. Others pointed out that there might be connections between basic and applied research. Most interestingly, one respondent differentiated between basic and applied research on the basis of the TRL scale. Accoridng to him, research beloning to low TRLs (I-II) is basic whereas research being at TRL III and above must be considered as applied.

Basic research comprises both theoretical and practical research to understand and explain fundamental principles in nature, but also in culture and human interaction.

Applied research has immediate practical applications and it uses or adapts to a large degree pre-existing knowledge for developing a fit-for-purpose solution.

Indicative defintions as provided by the respondents

When it comes to the JRC research activities, 39% of the respondents categorise their research as applied, 27% as mixed and only 5% as basic, a rather anticpated outcome given the nature of JRC activities.

With regards to the prevailing attitudes, the participants were asked to rate two statements. The majority (58%) of JRC employees agree or strongly agree that "the diffusion of research results and processes may be exceptionally restricted on the grounds of international and national security concerns". A higher percentage (63%) agrees or strongly agrees that ‘showing due diligence with regards to security implications of their work is an important parameter to be taken into account when conducting research.” Although, the first statement touches upon a delicate issue that may be perceived quite negatively in a research environment, JRC staff adopts a rather receptive stance.

Last, the participants asked whether they would see as useful the possibility to follow training on the dual-use export controls. A significant number (46%) replied that they would like to receive training on that topic.

8.4 Building the 'risk profile' of the JRC: an overview

The risk identification method requires correlating legal obligations, the sensitivity of research and the institutional processes in place for identifying the level of risk relating to the operation of an organisation. The foregoing sections exemplified how this can be done in the practice and what the possible challenges are. The section below offers some main conclusions with regards to the risk profile of the JRC.

The legal obligations: First of all, the Italian government by force of the legislative decree 96/2003 specifies certain aspects of the EU Regulation such as the conditions for using general authorisations and the applicable sanctions for different types of violation of the export control law[483]. The law does not set any specific requirement for exporters to apply internal measures. However, it stresses that transfers of controlled technology and software over the internet shall be subject to authorisation (Article 15). It is also interesting that the law provides for specific sanctions depending on the type of infringement. For instance, omission of record keeping procedures is punished with a fine from €15.000 to €90.000. The unauthorised transmission via internet or other electronic means of listed items is punishable by imprisonment up to 2 years plus economic fines. Indeed, the law provides for the 'seizure' of the website containing controlled information. The provision of technical assistance in connection to a military end-use may bring imprisonment up to 2 years, while where a WMD end-use is in view the penalty may increase to 4 years. These provisions bear some importance given that a research organisation such as the JRC 'exports' in principle technologies and technical services.

Sensitivity of research and types of activity involved:

- Almost all JRC Institutes may use or, in some cases develop potentially controlled equipment, methods and software;
- Certain Institutes and Units appear to be facing a higher degree of sensitivity from an export control angle (ITU, Ispra Site Management, IRMM and IHCP);
- JRC collaborates mostly with government authorities. JRC has a rather limited number of competitive projects and therefore, export control risks may be attenuated. However, the formal collaborations with international organisations and governments do not necessarily imply that export control requirements are not applicable;
- 8% of the participants replied that they have applied for an export authorisation in the past (includes previous working experience too);
- Technology transfers and license agreements for software represent a source of concern;
- Dismantling laboratories and sale/ donation of equipment represent a possible area of concern;

[483] Legislative Decree No 96 "*Implementation of certain provisions of Regulation (EC) no. 1334/2000 setting up a Community regime for the control of exports of dual-use technologies, as well as' technical assistance intended for military purposes, in accordance with Article 50 of the law 1 March 2002*, no 39, Official Gazette 102, 2003, retrieved from: http://www.camera.it/parlam/leggi/deleghe/03096dl.htm

- The overall sensitivity of the research undertaken by the organisation could be evaluated as medium. There are clearly sensitive types of research but 'exporting' activities are most of the time limited to intra-EU transfers.

Existing processes for addressing export control risks:

- Export compliance is indirectly part of the day-to-day running of business. The survey showed that a non-negligible percentage of staff has applied for an export authorisation in the past. However, export compliance is not dealt with in a systematic way fostering a culture of compliance and preventing risky transactions from happening.
- There are different institutional processes in place (customs office, personnel screening, contract review, patents and technology transfers office) ensuring conformity with security rules and other applicable regulations. However, the risk assessment does not take into account by default export control issues.
- The JRC's overall stance could be characterized as reactive. As past experience showed, the JRC complies with export controls without implementing a comprehensive export compliance strategy but relying mainly on the awareness of its employees.

Attitudes and level of awareness:

- Permanent staff is better positioned in terms of awareness compared to temporary staff. About half of the participants replied that they are aware of the dual-use regulation.
- 63% agree that showing increased responsibility with regards to security implications of their work is an important parameter.
- 46% would like to receive training on export controls. Generally speaking, the more an institute is concerned with the topic, the more merit is see in following training.
- JRC staff seems to be generally aware of dual use export controls. However, this does not mean that they realise how their work relates to export control risks.

Concluding remarks: The EC Joint Research Centre is a sui generis organisation. It is part of an international institution of specific legal nature and its functioning is underpinned by legally binding intergovernmental agreements, the European Treaties. This fact implies certain opportunities and challenges from an export control point of view. Most notably, thanks to the proximity of JRC to the EU policy-making and its active engagement in issues relating to security and non-proliferation, JRC is well positioned in term of awareness of export compliance issues. In fact, JRC scientists may know about export controls for a number of reasons such as:

- awareness raising seminars conducted in the past by the STREX team
- in their capacity as responsible scientists working for the EC

- the proximity of JRC to EU policy-making and JRC's active involvement in issues relating generally to security and particularly to export controls
- the sensitivity of their research or past incidents of non-compliance

At the same time, the JRC staff may feel immune to risks relating to export controls. This is to some extent justified. NSU scientists for instance, work for the accomplishment of non-proliferation objectives and the recipients of their research are mainly government authorities and international organisations working again in the fields of nuclear security and safety. However, to the extent that JRC collaborations and subcontracting include provision of equipment and technology to research institutes and universities in non-EU countries or, have commercial aspects certain precautions need to be taken. One should not forget that end-use undertakings, sanction restrictions and especially controls of intangible transfers of technology require showing due diligence and taking up concrete actions so as to minimise the possibility for the organisation to contribute inadvertently to a sensitive transaction. Moreover, it should be reiterated that certain equipment and technologies require an authorisation also for transfers within the EU.

Second, the fact that JRC employees are generally aware of dual-use trade controls does not imply that they also realise how their work may connect to export control risks. The shift of export controls towards an all-encompassing and modern approach means practically that the term 'export' covers different possibilities and also, the export compliance concept includes a number of concerns stemming from interrelated but different legal frameworks. Reasonably, one needs to go through an 'initiation process' and follow related training for becoming familiar with and understand better the logic and the implications of export controls. This need for training concerns both scientific and administrative staff and should be underpinned by a broader strategy for coordinating different policies, procedures and setting tangible compliance targets. In that regard, particular attention needs to be paid to temporary staff. It is a very common and useful practice for the JRC to employ scientists under contracts of determined duration. In addition, temporary staff needs to acquire a general understanding of export controls and comply with the applicable rules and procedures.

Third, the JRC as part of the European Commission could take advantage of established procedures and mechanisms as well as quality management practices for addressing and integrating export compliance into existing structures. Section 8.2.3 discussed the institutional processes being currently in place and relating to export control issues. In relation to this, the analysis suggested simple measures that could be taken in order to establish a compliance system and foster a culture of responsibility and export compliance. Whereas, as said above, such initiatives need to be part of a broader strategy, at the same time it must be ensured that researchers are not overburdened with bureaucratic procedures and overly strict internal rules.

An export compliance system equipped with certain policies and procedures could initially target those Institutes undertaking research in areas of high dual-use potential such as the ITU (nuclear safeguards and security), the IRMM (nuclear safety and standards) and the IHCP (bio-chemical) and then expand to cover other sensitive areas. In fact, a compliance system

could be launched as a pilot programme in one of the Institutes, tested for a certain period of time, improved and then expanded at JRC-wide level. Once the system is fully operative, an ECO, an export control responsible could be appointed in each institute for questions and assistance in the preparation of an export application if necessary. The overall coordination and monitoring of the system should be entrusted to a central export compliance function. As long as certain quality management principles are respected, the specific location of the export compliance function in the organigram of the organisation has little importance.

Table XIII: A SWOT analysis for the JRC

Strengths	*Weaknesses*	*Opportunities*	*Threats*
Established security policies & approval procedures	Lack of an export compliance system	Back up the policy formulation in the area of trade controls	Different legal frameworks applicable
Modern model of governance	Lack of an export compliance culture	Proximity to the EU policy making	Nature of activities (sensitive fields, applied research)
Lawful partners	Different locations (fragmentation of activities)		International collaborations
Part of the European Commission (good governance practice)			Flow of researchers

8.5 'Refining' the risk identification method (SPO)

This part intends to evaluate and further elaborate the risk identification method as tested in the JRC context. In doing so, the analysis shows what worked well and most importantly what was missed out. The ultimate goal is to draw conclusions with regards to whether such a method represents a useful practice to follow in different organisational environments, and mainly in research organisations and universities.

First of all, the core idea of the risk identification method is (1) to assess the sensitivity of research undertaken by an organisation and (2) to evaluate the operation of institutional policies concerned by export-related activities keeping in mind (3) the obligations set in the law. At the end of the process one should be in place to evaluate the imminence of export control risks to occur given the sensitivity of research and the capabilities of the organisation to deal with such risks. This way the organisation will be able to set up a fit for purpose export control system by adapting existing procedures and introducing new ones only where deemed as necessary. The abbreviation SPO can be used for naming this basic method: S stands for Sensitivity, P for Processes and O for obligations.

The test case of the JRC showed that in fact there is also a step (0) to be taken prior to applying the core steps of the SPO: the analysis of risks at 'macro-level'. This step involves a first analysis of the risk profile of the organisation in general and it addresses the following aspects:

- *Organisational structure:* How central is the model of governance of an organisation? Generally speaking, the more decentralised an organisation is, the more difficult will be to identify risks and implement common mitigation procedures. For instance, the constituent units may follow different policies and procedures warranting different actions. In addition, the different locations where an organisation operates is a relevant issue to consider.
- *Type of research:* What are the key competences of an organisation? Does the organisation undertake mainly basic or applied research? Is it active in proliferation related disciplines or defence related research? These are all plausible questions to ask here.
- *Main Partners:* What are the sectors of origin for the collaborators (public authorities, industry, academia, defence related *etc.)* of an organisation and what percentage of the funding sources they represent?
- *Scope of activities*: How international is a research organisation and, what types of activities are involved in the conduct of its research (travelling, provision of services on site, operation of int. campuses, patenting etc.)
- *Level of awareness:* Are there indications about the level of awareness and the patterns of behaviour pervading the interactions between the employees of an organisation?

Reasonably, this introductory risk assessment does not need to be in depth –this rests upon the next steps of the SPO- but it is necessary for providing the background information required for understanding the organisational context. This approach was followed also for the JRC in the introductory section of chapter 8. The outcome of such preliminary evaluation could be that the organisation is not concerned at all by export control issues (think of a university providing mainly undergraduate courses and maintaining limited research activities in disciplines relating to humanities for instance). If this is not the case the following step is the evaluation of risks at 'micro-level'.

This step (1) includes the evaluation of sensitivity of research and could conclude that the research activities of a given organisation are of low, high or medium risk. The assessment of the sensitivity of research requires taking into account what technologies are used or developed and what activities are involved in such research. The legal obligations and the control lists are the factors against which the risk assessment takes place. The question raised here is which units, departments or faculties should be chosen for this assessment. Ideally and depending on the resources available each unit could conduct the risk assessment for each own portfolio and activities. Alternatively, one could start by selecting departments or units potentially most vulnerable to export control risks. It is at this stage where the launch of an

online survey could provide further evidence for identifying areas of concern and selecting most sensitive units.

The initial selection and the assessment of the sensitivity of research should be based on the collaboration between a legal expert knowing the regulatory framework of export controls and a technical expert or manager having deep knowledge of the research portfolio. A potential problem could be the case where a university or organisation is such a decentralised structure that the manager does not have a complete picture of the undertaking activities. The JRC case study represents an academic exercise. In that regard, the author lacked the required resources and expertise for conducting the risk assessment for all sensitive units. Also, for reasons of consistency with the method as described in this part the online survey should have already been conducted in the phase selection of most sensitive units and not as a supplementary action taken at the end of the SPO. The general objective of this phase is to determine whether the research undertaken by the selected units and accordingly by the organisation as a whole could be regarded as of low, medium or high risk. It goes without saying that the process allows also to draw conclusions concerning the specific challenges and sources of risk stemming from the activities of the organisation.

The next step (2) requires considering the existing institutional policies and procedures relating directly or indirectly with export control issues. Exploring whether export control risks are taken into account or addressed by internal policies and processes within the selected Units is of central importance for suggesting improvements and integrating export control objectives where necessary. What the potential aspects connecting to export controls are was illustrated vividly in the JRC test case as well as the case studies discussed in chapter 7. Definitely, the logistics and the legal departments could have a more active role to play with regards to export compliance. Also, the case study illustrates the accompanying measures that could benefit export compliance and foster a culture of responsibility such as staff regulations, codes of conduct and ethics committees and certainly, security related policies and measures. The result of such an institutional assessment would help one to answerer whether the organisation can be considered as (a) unaware (b) reactive or (c) proactive. It is noted that an organisation may generally comply with export control requirements even in the case where it does not implement a formal compliance system.

At the final phase (3), one could rely on the results of the assessment for both the sensitivity of research portfolio and the responsiveness of an organisation to export control concerns so as to design effective and efficient compliance procedures improving an organisation's management system, reducing the compliance costs and eliminating any undue burdens. It is reminded that the integration of such polices and measures to the broader compliance and management system of the organisation would lead to significant benefits as well as other positive side effects. Such benefits include the thoroughgoing sustainability of the export compliance structure, the incorporation of proliferation risks into an aggregated risk portfolio,

the reduction of costs and complexity through convergence of structures, higher efficiency and avoidance of disputes over competencies[484].

[484] Makowicz, "ISO 19600 as Benchmark for Management of proliferation within an Integrated Compliance Management System," 30.