

Restrictions on Public Disclosure of Research Results at U.S. Universities

Classified Research vs. Fundamental Research

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Summary

U.S. universities have traditionally emphasized a free and open research environment. This open and unrestricted ability to conduct the research enables the creation and dissemination of knowledge and its rapid publication that contributes to the advancement of scientific knowledge and discovery, without any restrictions. . The publication of the results obtained from open academic research allows the scientific community to validate the findings, and advance the science . For this reason, most universities basically do not accept research projects that restrict their ability to publish including those that are classified by the government as security-related research, or research funds from companies with any restrictions on the publication of their findings.

Universities do accept projects with some restrictions on disclosure of certain information under certain conditions. Such research is referred to as "Restricted Research," which also includes research commissioned by companies on the premise of confidentiality of proprietary information, protection of individual's private data, and defense-related classified research commissioned by the government. Each university in the U.S. has its own policy for accepting research projects subject to such restrictions, which is is disclosed externally.

This paper summarizes the policies of Restricted Research at U.S. universities in comparison with Fundamental Research, which has no restrictions on the publication of research results. In particular, we discuss how the Security Clearance system is operated in Classified Research, which is a part of Restricted Research, in relation to the so-called Security Clearance system that has recently been considered for introduction in Japan, and suggest recommendation for the design of a similar system in Japan.

1 . **Restricted Research**

When U.S. universities sign contracts, or grant agreements, for research projects with the government, foundation, or companies, the most important thing is that there will be no restrictions on the publication of research. In collaboration with companies, there may be cases in which a right of first refusal is established for the handling of patent rights related to the results of the research, but many universities do not accept conditions that restrict the publication of research results. This is because freedom of publication is the most important principle for researchers and institutions. For graduate students, publication is also a critical condition for their degree.

An important keyword in this context is "Fundamental Research". For U.S. research institutions, however, the term "fundamental research" is somewhat different from the Japanese term "basic research," and refers to "research whose results can be made public. It is defined as "basic and applied research in science and engineering whose results are normally made public and shared widely in the scientific community," rather than "fundamental research in the sense that it is not applied research" in Japanese (National Security Decision Directive issued by President Reagan on September 21, 1985 Directive-189, NSDD-189 was based on a NAS report³). The background to this treatment of Fundamental Research reflects the strong result of the conflict between the longstanding emphasis by U.S. universities on openness, including the freedom to publish their results, and the pressure to constrain publication due to security concerns. In fact, in the U.S., the compatibility between scientific openness and security has been a constant debate since the publication of NSDD-189.

In the 1980s, federal agencies' concerns about the potential leakage of military technology to the Soviet Union from U.S. universities led to the establishment of the DoD-University Forum by the AAU and the Department of Defense to discuss measures against the shared concerns.⁴ The aforementioned NSDD-189 report was compiled as a result of these discussions. There, the basic idea is expressed as "Fundamental research should not be restricted whenever possible, and classified classification designations should be used as a mechanism to manage information generated during federally funded basic research only when management is deemed necessary."⁵

After this process, the government regulations for U.S. universities when checking whether a paper is considered Fundamental Research that can be published, are four systems listed below⁶.

- ① Whether or not it touches classified information designated by the state Classified Information: Executive Order 13526--National security information
- ② whether they information is covered by the International Traffic in Arms Regulations (ITAR), or Export Administration Regulations(EAR)
- ③ Controlled Unclassified Information (CUI)

³ National Security Decision Directive-189 issued by President Reagan on September 21, 1985; NSDD-189 cites the NAS Report.

⁴ <http://aueco.org/wp-content/uploads/2016/04/NSDD189.pdf> Report of the DoD-University Forum for Calendar Year 1984.

⁵ To the maximum extent possible fundamental research should remain unrestricted; classification should be used as the mechanism to control information To the maximum extent possible fundamental research should remain unrestricted; classification should be used as the mechanism to control information

⁶ Tobin Smith

- ④ Other restrictions such as the biosecurity regulations: Select Agents Regulations: Department of Health and Human Services & USDA, etc.

In the case of research based on a contract with a company, the universities examine whether there are any clauses in the contract that restrict publication of the paper. For example, commissioned research that is contingent on the transfer of intellectual property as a condition of the contract from a company is subject to careful consideration. Such research is sometimes called as proprietary research, meaning "research that the funder may request confidentiality of the research proposal, data and results for a certain period of time, or result in intellectual property owned by an outside entity..

As a result, many universities have established policies for the handling of Classified Research, which requires the confidentiality of research results, and Restricted Research, which includes research that requires a delay in the publication of research results⁷. Many US universities do not accept such restricted research in principle.

However a few US universities accept these Restricted Research as exceptional cases often indicated by their policy, and the permissible range varies from university to university.

For example, the University of Illinois at Chicago's (UIC) policy is that "UIC will not accept any grant or contract involving confidential or restricted research and, except as permitted by this policy, other UIC policies, or general regulations, may not use UIC facilities or resources in the name of the University or and may not conduct confidential or restricted research," while an exception to this is "a delay of up to six months in submitting publications for sponsor to apply for a patent in a technical testing contract or faculty consulting contract. This must be approved by the Office of the Vice Chancellor for Research (OVCR) at UIC upon written proposal by the principal investigator prior to the application for funding. In addition, an exception to the prohibition on Classified Research may be made for projects that involve off-campus access to classified information and are authorized by a University of Illinois agreement with the Department of Defense or other applicable federal agency or department. Specifically, with the approval of the UIC Provost, UIC may waive or modify any provision of this policy regarding classified research if it addresses an imminent threat to national security documented by the government sponsor. Any waiver will be granted for the shortest possible period of time, with a clear sunset provision, and only if the principal investigator certifies that all regulatory requirements for the handling and protection of classified material, including appropriate Security Clearance, have been met."

⁷ Many universities allow a delay of 30 days and can extend up to 60 days

Similarly, with respect to MIT, "As a general policy, MIT does not conduct confidential research on campus or research whose results cannot be made public without the permission of, for example, government or industry research sponsors," while "MIT has a unique role to play in important areas of science and technology that are of great national interest. MIT recognizes that the pursuit of knowledge may involve extremely important but sensitive areas of technology where immediate distribution of research results is not in the best interest of society. In such cases, exceptions may be made to these policies regarding publication, classification, and access by international students and scholars, but only in the very rare case that the field of research is critical to MIT's educational mission and that an exception is clearly necessary for the national interest. If they are not met with these conditions, MIT will reject or discontinue the activity and suggest it for consideration off campus or elsewhere. Because conducting classified or otherwise restricted research on campus would significantly alter the academic environment of the Institute, it is essential that each project be considered and addressed in light of its impact on the Institute as a whole. Therefore, all research projects within the academic structure of MIT (with the exception of the Lincoln Institute) that need to be subject to restrictions must be approved in advance by the Provost, who will seek the advice of the Faculty Policy Committee and notify the Committee of all approvals"⁸

As the phrase "except for Lincoln Labs" indicates here, MIT has an organization that conducts exceptionally classified research. MIT Lincoln laboratory was established by the Massachusetts Institute of Technology and the U.S. Department of Defense in 1951. The first research result was the research and development of the first U.S. air defense system, integrated a number of research findings, including digital computers, magnetic core memory, large-scale computer programs, modems, and interactive graphical user interfaces.⁹ It is stated that the intellectual property technology of the research results managed by MIT transfer, which will enable the U.S. military to take advantage of innovative technological advances.

Such an exception, however, seems to be a more conservative when it applies to graduate education, etc., than is the case for research conducted by university researchers and require more careful handling.; in the MIT example, "However. . theses, whether graduate or undergraduate, are an integral part of the Institute's research program, and no thesis requiring clearance to students or requiring security review upon completion may be initiated without prior approval of the Provost. Where a thesis is involved, the Provost shall seek the advice of the Graduate Policy

⁸ <https://policies.mit.edu/policies-procedures/140-research-policies-and-public-and-private-support/142-open-research-and-free>

⁹ From the description of MIT Lincoln Lab web page at <https://www.ll.mit.edu/about/history>

Committee and shall report to that committee on all approvals if they involve changes to existing policies."¹⁰ The background is that the inability to present a dissertation is fatal to degree-seeking students.

2. Requirements for Classified Research

Even if a university decides to make an exception for conducting Classified Research, several statutory conditions must be met for a research group to conduct the Classified Research.

First of all, not just anyone can participate in Classified Research, but in order to access any Classified Information for conducting Classified Research, a qualification called "Security Clearance" is essential.

Security Clearance is "a system of personnel and facility access restrictions established under the national security information system" in the United States and other countries. In the U.S., it relates to the three levels of classified information (Top Secret, Secret, and Confidential) as defined by Presidential Decree No. 13526 and others, including (1) military plans, weapons systems, or military operations, (2) foreign government information, (3) intelligence, information sources, methods, or codes, and (4) classified sources. (5) Scientific, technical, and economic matters related to national security (6) Government programs for safeguards of nuclear materials or facilities (7) Vulnerabilities or capabilities of systems, equipment, infrastructure, projects, plans, and protective services related to national security (8) Development of weapons of mass destruction, etc. The United Kingdom, France, Germany, Canada, and Australia also have a similar three-or two tier system for restricting access to information. ¹¹

When a university or other research institution engages in confidential research using such sensitive information, Facility Clearance is also required for the facility where the research is

¹⁰ [From website of DCSA:https://www.dcsa.mil/Industrial-Security/Entity-Vetting-Facility-Clearances-FOCI/Foreign-Ownership-Control-or-Influence/](https://www.dcsa.mil/Industrial-Security/Entity-Vetting-Facility-Clearances-FOCI/Foreign-Ownership-Control-or-Influence/). Original from 32CFR Part117(NISPOM), § 117.11(FOCI).(6)Factors <https://policies.mit.edu/policies-procedures/140-research-policies-and-public-and-private-support/142-open-research-and-free>

¹¹ Upon review, national security eligibility will be determined, which includes stability, reliability, discretion, character, integrity, and unquestionable loyalty to the United States. These include stability, reliability, discretion, character, integrity, and unquestionable loyalty to the United States. In determining eligibility on the other hand, the program does not discriminate on the following factors: race, color, religion, sex, national origin, disability, sexual orientation, and mental health counseling alone cannot be used to draw a negative conclusion.

conducted. The review includes the facility's information management system, ability to secure the facility and restrict access, who plays what role in the management structure of the organization, identifying the Key Management Personnel in each organization and determining the extent to which confidential information is shared and with whom. At the same time, the organization's Foreign Ownership, Control, or Influence (FOCI) is also reviewed. Here, if it is determined that a foreign interest has the power, directly or indirectly, to direct or determine matters affecting the management or operations of the company in a manner that could result in unauthorized access to confidential information or adversely affect the performance of a confidential contract, the company is considered to be operating under FOCI and ineligible for Facility Clearance. In determining whether the organization is under FOCI, factors relating to the company ownership and control, the foreign interest, and the government of the foreign interest will be considered and reviewed in totality. Specifically, records of economic and government espionage activities against U.S. targets, records of conducting and/or engaging in unauthorized technology transfers, the type and sensitivity of information accessed, and records of compliance with relevant U.S. laws, regulations, and contracts are subject to review.¹² Detailed guidelines for these series of processes are provided by DCS .¹³

However, university personnel do not necessarily obtain clearance solely for the purpose of conducting Classified Research at the university, but also when they need classified information held by a government agency in order to conduct a project in which they are participating. In such cases, university facility clearance is not required.

In any case, when an individual belonging to a University requires a Security Clearance because of their participation in a project involving the government. For that contract to take place, it is assumed that the DoD, State Department, Department of Energy, or other agency determines that the researcher needs access to classified information in order to carry out the contract. The process requires that the employer, the university, to approve the need by signing the contract, and the individual would submit clearance application materials for institutional review and agency approval. To summarize, the case in which an individual affiliated with a university obtains a Security Clearance is only a case in which the university, as an organization, approves the need for the clearance and becomes the contracting entity. This is quite different from the scheme in which "an individual who has access to sensitive information personally obtains the clearance". Upon such

¹² <https://www.dcsa.mil/Industrial-Security/Entity-Vetting-Facility-Clearances-FOCI/Foreign-Ownership-Control-or-Influence/>

¹³ <https://www.dcsa.mil/Industrial-Security/Entity-Vetting-Facility-Clearances-FOCI/Facility-Clearances/>

determination, not only the individual conducting the research, but also the organization's management such as president or Provost of university may be required to obtain Security Clearance.

For example, the University of California has managed the operations of three U.S. Department of Energy (DOE) national laboratories (Lawrence Berkeley National Laboratory, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory) for nearly 70 years, with Los Alamos and Livermore in particular engaged in highly classified research work. For a university to effectively manage these laboratories, a group (Key Management Personnel) must have access to classified information, which requires that university executives, including the president, also have Security Clearance¹⁴. However, this is not the case for all universities, and even KMPs such as the president of a university conducting Classified Research (about 20 universities) may be exempt from Security Clearance if they do not need to know classified information for governance purposes.

There is an argument that the Security Clearance System needs to be developed in Japan as well. In this regard, Law No. 108 (Specially Designated Secrets Act on the protection of Specially Designated Secrets, abbreviated SDS Act), which was enacted in 2013 and went into effect the following year, designates information related to Japan's national security that must be kept secret as "specified secrets" and stipulates the implementation of a suitability assessment for those handling such information and penalties for leaking such information. The Japan SDS Act is relevant to the US Security Clearance Act. The information subject to this system is defined as "Information that has not been publicly disclosed and is particularly necessary to be kept secret because its leakage could seriously impede Japan's national security". Under this system, Security Clearance does not only apply to administrative agencies, but also to private businesses. Specifically, when an administrative agency deems it particularly necessary, it may provide specified secrets to a conforming business entity based on a contract with the conforming business entity. It is stipulated that the conforming business operator shall, in accordance with the contract, take necessary measures for the appropriate protection of the Specified Secret, and have its employees conduct a suitability assessment and perform the duties of handling the Specified Secret as those who are recognized as having no risk of divulging the Specified Secret.

However, even in such cases, the scope of information to be protected by Japan SDS act is extremely limited compared to the scope of Classified Information in the U.S. and other countries. Also Under information Protection agreement Japan's Act on the Protection of Specified Secrets has two levels,

¹⁴ The University's Policy: Regents Policy 1600: Policy on Security Clearance for Access to Federal Classified Information also indicates that this is the policy. <https://regents.universityofcalifornia.edu/governance/policies/1600.html>

Top Secret and Secret, and lacks a classification equivalent to Confidential in the U.S. CI classification, which makes it difficult to conduct research equivalent to the Classified Research conducted in the U.S. in Japan. It is also pointed out that the lack of a similar system is an obstacle to conducting joint research and development on sensitive technologies between countries with similar systems, or to receiving orders for products that use the same kind of technology.

For example, if a Japanese private-sector company establishes a US subsidiary and the employees and corporate facilities of the subsidiary meet certain technological requirements, the subsidiary can receive US security clearance. However, in such cases, the information obtained locally cannot be disclosed to the head office in Japan, which means that, for example, it is not possible to fully examine whether the technology of the head office in Japan can solve the problem of technological development in the U.S. This is a disadvantage in terms of competition with other countries, since it is assumed that other countries with equivalent systems may be able to share information.¹⁵

3. Classification of Research and Classified Research in U.S. Universities

3.1 Classification of Research at U.S. Universities

In this section, we will examine the classification of research conducted by U.S. universities in terms of publication restrictions and confidentiality as described in Section 2. In figure 1, the categories are classified into the basic Fundamental category of Non Restricted Research and Restricted Research, and each category is further divided into two categories. "Fundamental" refers to "basic and applied research in science and engineering whose results are normally published and widely shared in the scientific community," as mentioned at the beginning of this paper, and which is treated as an exception under export control. Among these, there are cases in which all the information used is only shared information generated by Fundamental's research activities, and cases in which controlled information, so-called CUI (Controlled Unclassified Information), is used. CUI, which is translated as "controlled unclassified information," refers to information that is not classified but should be properly

¹⁵ However, even if Japan has established a Security Clearance system equivalent to that of other countries, it does not mean that foreign governments will immediately allow private companies to share sensitive information with foreign governments. Therefore, access to security clearance information held by a foreign government under some kind of agreement would have to be done through the government of that country.

protected, examples of such information include those related to security and nuclear energy that is handled by government agencies. The basis for defining CUI is Executive Order 13556 (CUI), 32 CFR Part 2002 and NIST SP 800-171. The protection of controlled unclassified information (CUI) residing in non-Federal systems and organizations is recognized as being of paramount importance to Federal agencies and as having the potential to directly impact the ability of the Federal Government to conduct its designated mission and business operations.

Therefore, if a study uses such information, the information itself cannot be made public. Therefore, a review process is established to check whether or not information that should be controlled under CUI is included in research papers. On the other hand, research results using such information can be freely disclosed as long as no CUI is included, or there is a special contract term that restricts the disclosure of the results. In this respect, it differs from Classified Research, which restricts the publication of research results itself. It is important to note that this review process is completely different from the examining process to determine whether or not research results can be made public. In this case, the published technical information is treated as a Fundamental Research Exception including to the control of deemed exports for export control purposes.

It is noted that prototypes and other products resulting from these Fundamental research studies do not fall under the Export Control Exception and are subject to export control, and therefore cannot be inadvertently exported out of the country without obtaining an export license, if appropriate.

On the other hand, Restricted Research, which imposes restrictions on the publication of results, can be divided into two major categories. One is Classified Research, which uses Classified Information designated by the government. In other cases, research projects commissioned by companies may also restrict the release of research results. In the case where a company wants to keep its research results confidential as trade secrets, which means that the research results cannot be published without a review to ensure that no proprietary information is included, but in addition, the company wants to keep the results of research that is detrimental to the company, such as when the company's drug is found to be ineffective or has side effects, etc., this raises issues of conflicts of interest and research ethics. Under a contract with such conditions, universities must be very cautious about accepting it. On the other hand, a company may wish to impose conditions such as a six-month publication limit for the purpose of filing a patent application, or restrict publication for a certain period of product development, in which case the Provost's Office will decide whether or not to accept such a condition.

At Carnegie Mellon University, "In the case of research that results in intellectual property owned by a company or other entity, companies may wish to market products derived from inventions or ideas developed at the university. Therefore, they may wish to fund projects that restrict access to

data and discussion of ongoing research to individuals on a "need-to-know" basis, and that seek to delay publication of research results and data needed to validate results for a certain period of time." and that these projects are to be reviewed by the university if faculty member wishes to accept them. In the case of Carnegie Mellon University, "The Office of Sponsored Research shall review all proposals and contracts for conformance with these guidelines prior to approval. Those that do not meet these guidelines will be referred to the University Research Council (URC) for review and recommendation of appropriate action to the President." and even after the decision to accept, "The principal investigator is responsible for informing all members of the project (faculty, staff, and students) of the restrictions imposed on the dissemination of information related to the research. This must be done prior to the start of the project or before an individual joins an existing project."¹⁶ . It also states that "the Provost's Office is responsible for obtaining a signed letter from the principal investigator of a restricted research project certifying that he or she is aware of all restrictions imposed on the research and that all participants have been informed of these restrictions". The principal investigator who accepts the research is required to explain the terms of the agreement to the project members.

The last column indicates the area of classified research. Normally, publication of the results of such Classified Research is restricted. Basically, if research in this column is accepted, those who are engaged in the research are subject to Security Clearance, and the facility is also subject to clearance.

Those engaged in basic research in the blue area in the table are not subject to any of the various restrictions described above. However it is rather required to strictly manage processes and risks, and are also required to declare relationships that may be affected by their research. These are referred to as Integrity and Security controls, and are discussed in the context of recent incidents¹⁷ that have been uncovered at U.S. universities, such as intervention in research by foreign institutions and unjustified theft of research information. In order to prevent such problems, universities are now required to assess the risks and developed management strategies for their own research, and at the same time, the government and funding agencies are also demanding greater control. Specifically, for example, it is forbidden to provide research results to certain foreign organizations in return for

¹⁶ Carnegie Mellon University Policy on Restricted Research:
<https://www.cmu.edu/policies/research/restricted-research.html#:~:text=Restricted%20research%3A%20includes%20all%20classified,.publication%20of%20the%20research%20results> .

¹⁷Recent cases include the arrest and subsequent conviction of Dr. Charles Lieber of Harvard University after it was discovered that he had engaged in research work at a Chinese university without declaring his employment contract to the university.

personal benefits without disclosing them to the university. Integrity and Security management in the U.S. was initiated by voluntary management (High-Risk Partnering Management¹⁸) practices by U.S. universities that recognized the undesirable influence of foreign institutions on their research. In response to the concerns over research security, the U.S. government established specific requirements as a government policy in the National Security Presidential Memorandum No. 33, dated January 14, 2021 (NSPM-33). This includes: (1) Protection of the U.S. R&D system from interference and exploitation by foreign governments: NSPM-33 strengthens and standardizes disclosure requirements for information related to potential conflicts of interest and conflicts of responsibility of individuals who have a significant impact on the U.S. R&D system. (2) Protecting the Integrity of the R&D Regime: Take steps to protect intellectual capital, prevent misappropriation of research, ensure responsible stewardship of U.S. taxpayer funds, and at the same time maintain an open environment that fosters research and innovation that benefits the United States and the world. Specifically, the Act prohibits federal employees from participating in foreign government-supported recruitment programs, directs agencies to control access to and use of federal research facilities, and requires federal agency employees responsible for allocating research and development funds to receive training on research security.

As mentioned at the beginning of this paper, the majority of research conducted by U.S. universities is fundamental research. In this regard, when considering collaboration between Japanese and U.S. academia, it is important to consider whether this integrity and security management is sufficiently implemented. On the other hand, in Fundamental Research, even if the information used in the research is public information and the research results are made public, it does not mean that the research process does not need to be managed at all. It is necessary to adequately manage how the research is conducted in terms of collaboration, information management of the research process, and securing the research results as intellectual property. In particular, there has been a recent trend toward strengthening such controls, and for example, universities that receive NSF funding are considering systems such as requiring educational programs for faculty members and certain background checks for visitors to the university. ¹⁹

It should be noted that in all of these categories, prototypes and other products based on research results, rather than published papers, are subject to export control.

¹⁸ Toshiya Watanabe, University of Tokyo, Institute for Future Initiatives Policy Proposal: High-Risk Partnering Management by U.S. Universities and Implications for Japanese Universities (Tentative), February 2019.

¹⁹ Based on interviews with US funding agencies, University and AAU(American Association of University)

In addition to these research project systems, there is a secret patent system in which patent applications that are considered sensitive technology for security reasons and should not be disclosed to the public are deferred and kept secret, and this system is sometimes applied to corporate inventions. In principle, this system may be applied to university inventions as well, but in reality, there are almost no cases of restrictions on the publication of university research results under the secret patent system.

Table 1 Classification of Research Projects at U.S. Universities

Categories		Information used for research		Research results	Products based on research result
Non Restricted Reserach	Fundamental	Public Information	Open to the public	Open to the public by publishing	Under export control
		CUI	Public disclosure restrictions	Open to the public by publishing	Under export control
Restricted Research	Proprietary Research	May Include Confidential Information	Public disclosure restrictions	Public disclosure restrictions	Restricted by contract and/or under export contro
	Classified Research	CI	Confidential	Confidential	Confidential

CI : Classified Information CUI : Controlled Unclassified Information

Note: In this table, the notation "Confidential" does not mean that it is one of the three levels of CI, but that it is confidential including these three levels.

3.2 Relationships of research between categories of varying degrees of sensitivity at U.S. universities

As described above, U.S. universities are generally engaged in Fundamental Research, but there are cases, albeit exceptional, in which different categories of research are conducted within the same

organization with respect to restrictions on publication of results. In conducting research under such different rules in the same organization, there are some points to be considered in terms of management. Specifically, management methods for (1) the transition from Fundamental Research to Classified Research, (2) the opposite case, and (3) the case where the same researcher is involved in both cases are considered to be important.

First, we discuss some of the issues that may arise in transitioning from Fundamental Research to Classified Research. If a project meets the requirements of Fundamental Research with a fixed term, publication of the results of the research during that term is guaranteed, and there are no restrictions on publication because of the sensitivity of the results. There are many projects of DARPA and other U.S. military sponsored research projects at U.S. universities, but most of them are conducted in a manner that meets the requirements of Fundamental Research. In such cases, even if the project is sponsored by the U.S. military, there is no mandatory restriction on publication of the results after the project is completed. On the other hand, there may be cases where the results of a project are judged to be applicable to defense technology applications, etc., and a successor project may start as Classified Research. In such a case, the member researchers who have been working on the project need to obtain a Security Clearance if they wish to participate in the succeeding Classified Research project, and since it is not possible for them to continue working in a laboratory on a regular university campus, they need to obtain a Security Clearance and move to a dedicated facility, etc. to participate in the research.

However, university researchers have little incentive to participate in Classified Research because they will not be able to publish papers in the future. As a result, it is possible that the research group will be replaced by new members. Even in both cases, there is no restriction on publication of the results of earlier projects retroactively.

Our interviews with institutions conducting such research suggests that the project managers often give advice on how to publish papers such that classified information is not disclosed. In fact, such efforts are often made in the course of communication between project managers and researchers in a natural way, since there is a concern that even the results of fundamental research may contain sensitive elements in such cases that the application aspects are emphasized too much.

On the other hand, while researchers generally have little incentive to participate in Classified Research, there are some cases in which working on defense-related technology development for a certain period of time is attractive to researchers. Also in some cases, project managers expect key researchers who have been involved in research projects to participate in Classified Research. Such an offer is accepted if the researcher sees it as beneficial to his or her career and if clearance can be

obtained. Even though they choose to start classified research once, it is possible to return to a Fundamental Research project after a certain period of time. In such cases, the experience gained in Classified Research is considered useful for fundamental research as well. For students and graduate students, it is difficult to participate in Classified Research if publication is a requirement for graduation or completion of the program, while undergraduate students who are less likely to publish papers may obtain a Security Clearance and participate in Classified Research because of their interest in such jobs. Some companies require Security Clearance when students start working, so it is advantageous for students who wish to work in such companies to obtain Security Clearance in advance. Furthermore, Security Clearance may also be required by some government agencies for students to intern. At Harvard Law School, the university provides information for students who may be interested in internships on such cases²⁰ .

In addition, some researchers at MIT and other universities that conduct Classified Research as part of their university may be engaged in Fundamental Research at the same time as conducting Classified Research that deals with CI in one of their projects. In this case, the researcher has obtained a security clearance to engage in Classified Research and conducts the research in a dedicated facility (i.e. Lincoln Labs), while at the same time engaging in Fundamental Research on the regular campus. Of course, Classified Information cannot be used for general research, and while there is a strict distinction between the two in terms of information management and rules for handling results, it can be inferred that there are advantages to conducting research that straddles both.

4. Characteristics of the U.S. research system and challenges for Japan-U.S. research collaboration

²⁰Harvard Law School's website for posting employment information <https://hls.harvard.edu/bernard-koteen-office-of-public-interest-advising/opia-job-search-toolkit/security-clearances/> states that "Most federal agencies require summer, semester, and graduate applicants to undergo some level of security screening prior to employment. . . . For full-time employment, more extensive checks may be required, including references, former employers, co-workers, friends, neighbors, landlords, institutions of higher education, and credit/military/tax/police records. If you have access to classified information or are involved in national security, you may require a "Security Clearance," which requires an even higher level of screening. Agencies that have historically required a Security Clearance include the Department of Justice, the CIA, and parts of the Department of Defense. However, DOJ and other federal agencies can take a long time to obtain a suitability test and Security Clearance, which can be a significant obstacle for some applicants".

As we have seen, the following characteristics of the system of research and development conducted by universities and other research institutions in the United States can be summarized.

- ① Based on the idea that a free and open research environment is important and that scientific results should be tested by being made public, emphasis is placed on Fundamental Research within the scope of the Fundamental Research Exemption under the U.S. Export Administration (EAR), and many universities have a policy of basically not accepting research that does not meet the requirements of the Fundamental Research Exemption under the U.S. Export Administration Regulations (EAR). In such cases, if the information used in the research includes CUI that must be controlled, the research results themselves will not be restricted from being published, although a review may be conducted to ensure that no CUI is disclosed in the published paper of the research results.
- ② With the recent cases of theft of information and know-how related to the research process for the purpose of exploiting the openness of Fundamental Research for the military technology by certain countries, etc., it is necessary to understand the impact of collaborations with foreign institutions and to prevent and reduce their undesirable effects. Integrity & Security management is mandated.
- ③ On the other hand, in exceptional cases, Classified Research using Classified Information may be accepted after deliberation of the significance and conditions, etc. In such cases, the participating researchers must obtain a Security Clearance, and the facility and organization conducting the research must obtain Facility Clearance, as well as restrictions on publication of research results. In such cases, participating researchers may have additional restrictions in interacting, and sharing of information with their colleagues who are not subject of a Security Clearance, and the facilities and organizations conducting the research must obtain Facility Clearance, and the publication of research results and articles are restricted.
- ④ In addition, in the same way as with Classified Research, when there are restrictions on publication of research commissioned by a company, etc., the acceptance of such research may be accepted on an exceptional basis after deliberation (Proprietary Research).
- ⑤ Between of the existence of these different research categories, researchers may move from one to the other or hold concurrent positions, but the rules for both are strictly demarcated.

These characteristics are characterized by the fact that the role of academic research at universities and other institutions is focused on the creation of knowledge that is valued through the publication of results, and that any restrictions that would undermine such value, whether related to government defense secrets or corporate requests, are regarded as exceptions, and careful business judgment is

exercised when accepting such research. The composition of the situation is clear. As a result, although there is movement of people on both sides, the two are clearly separated and the contrast is stark.

On the other hand, for Fundamental Research, which allows publication of results, Integrity & Security management has been introduced as a mechanism to eliminate attempts to undermine transparency and openness as a rule. This concept has been agreed upon by the G7 countries as of 2023.²¹

Based on US system and operation, what is required of Japan's research system when conducting research collaboration with U.S. universities operating under such a system? First, Japan does not have the same system for conducting Classified Research, such as Security Clearance or Facility Clearance using Classified Information, which would be a fatal problem if collaboration in these fields were to take place. While it is unlikely that Japanese and U.S. universities and other research institutions would participate in literal defense research, in the case of Japan-U.S. (and also with other countries which have the similar system) research cooperation in dual-use areas such as cyber security and advanced space technologies, strict confidentiality control is naturally required, and universities and other academic research institutions may be able to contribute. In this regard, it is considered inevitable that these institutional arrangements are necessary. Also it is noted that while major countries have established systems such as Security Clearance, and private companies and others cooperate with each other in these countries, it has been pointed out that the lack of such a system in Japan makes it difficult for private companies and others to cooperate with these countries. The lack of an equivalent system in Japan has been pointed out as making it difficult for the private sector to cooperate with these countries.

Another issue is that, like CI, there is no equivalent system for CUI in Japan. In fact, some argue that CUI is more important than CI for information used in private R&D in the U.S.²² .

Despite these issues, it is important to note that, as shown in this paper, the majority of research at U.S. universities is fundamental research, and classified research is a rare exception. In the area of Fundamental Research, Japanese universities and other research institutions are expected to fully implement Integrity & Security management, which is the same as that in the U.S. and is also a G7

²¹ G7 Security and Integrity of the Global Research Ecosystem

(SIGRE) The working group's outcome document is shown below:
https://www8.cao.go.jp/cstp/kokusaiteki/g7_2023/annex2_sigre.pdf

²² council of experts

agreement. On the other hand, it is important for smooth research exchange to avoid imposing other restrictions as much as possible. In this regard, the fact that a wide range of Fundamental Research Exemptions, which are allowed under the U.S. export control system, are not allowed under the Japanese export control system, should be considered. For example, in the case of Japan-U.S. joint research in the field of Japanese list-controlled technology and the result of which is intended to be published, there are no restrictions on the participation of the foreign researchers and the provision of the technology arising during the research if it is recognized as Fundamental Research in the U.S. side, but in Japan, permission from METI is required to have foreign researchers and to provide the technology to the U.S. before its publication, so it is not recognized as Fundamental Research in the U.S. at worst.²³ In this case, U.S. universities may not be able to participate in joint research projects. Although there have been no such cases in the past, Japan's export control has become stricter in recent years, and the fact that, for example, the presentation of a dissertation that is scheduled to be made public soon to other students is also subject to export control restrictions, differs greatly from the operation of export control in the U.S., where exceptions are applied without problems, and there are concerns that this could become a problem in the future.²⁴

In this regard, for example, if a Japanese government project envisages collaboration with the U.S. or other countries, a provision that halfway restricts publication of papers may be an obstacle to collaboration as a Fundamental. The U.S. also has a system of secret patents and does not specify the technical fields covered by patents, as is the case in Japan. It is important not to raise concerns about the possibility of exceptions to the Japanese system by clearly explaining that they are exceptions and the purpose of such exceptions.

In summary, in the U.S. research system, there is a clear contrast between "Non Restricted," which includes Fundamental areas, and "Restricted," which includes classified areas. It is important for the Japanese system to adopt clear distinctions and operations, and to be able to clearly explain each of them.

²³ In EAR, fundamental research is defined as "research in science, engineering, or mathematics, the results of which ordinarily are published and shared broadly within the research community, and for which the researchers have not accepted restrictions for proprietary or national security reasons". Therefore, research subject to the Foreign Exchange Law may not be considered Fundamental Research.

²⁴ In EAR, knowledge submitted with the intention that such information will be made publicly available to researchers conducting fundamental research is treated as "published" and is not subject to the EAR. Given that the majority of research at U.S. universities is fundamental research, this rule seems to reduce the procedures considerably required for export control within the university.

5. Conclusion

This paper summarizes the position and policies of Restricted Research at U.S. universities in comparison with Fundamental Research, which has no restrictions on the publication of research results. In particular, the paper discusses the need in Japan for the Security Clearance and Facility Clearance systems, which are necessary for conducting Classified Research.

On the other hand, it is important to manage the integrity and security necessary for Fundamental Research, which is a major part of international research exchange, and it is necessary to deregulate export control. In short, a contrasting institutional design like that of the U.S. is necessary. By combining these two areas as effectively as possible, we can promote the accumulation of knowledge in an international open environment, and at the same time, we can try to build a new national innovation system that obtains results from restricted research with clear objectives and strict information management. The combination of these two research system will promote the accumulation of knowledge in an international open environment and lead to an attempt to build a new national innovation contribution system that obtains results from restricted research with strict information management.

Literature

1. Toshiya Watanabe and Toru Yoshioka (Kobayashi), "The Patent Registration Deferment System and Compensation from the Perspective of National Security - Discussion Paper on the So-Called 'Secret Patent System'," Security Studies Unit, Institute for Future Initiatives: FY2021 Working Paper Series No. 5, July 14, 2021 (in Japanese)
2. Toshiya Watanabe, "What is Emerging Technology in the U.S. NDAA 2019 - Expansion of Export Control Operations and its Impact on Technology Policy," Cistec Journal 183 115-124, September 2019 (in Japanese).
3. Report of the event, "Challenges for Japan's Export Control Operations in U.S.-Japan Research Cooperation [U.S.-Japan Online Symposium: Economic Security and Export Control Issues in

International Research Cooperation," September 29, 2022, <https://ifi.u-tokyo.ac.jp/event/13682/> (in Japanese)

4. Toshiya Watanabe, "The Actual State of High-Risk Partnering Management by U.S. Universities and Implications for Japanese Universities (Tentative Version)," Policy Proposal by the University of Tokyo's Research Unit for Industry-University and Social Collaboration Systems, Institute for Future Initiatives, http://pari.ifi.u-tokyo.ac.jp/publications/policy190227_uisp.html February 2019 (in Japanese)

5. Toshiya Watanabe, "How to Face the 'Foreign Influence' of Self-Management Pervading U.S. Universities," Toyo Keizai, Toyo Keizai, June 26, 2021, at 68-69, June 2021. (in Japanese)

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