IN THE PUBLIC INTEREST

REPORT OF

THE AD HOC FACULTY COMMITTEE

ON ACCESS TO AND DISCLOSURE OF

SCIENTIFIC INFORMATION

Massachusetts

Institute of Technology

COVER PHOTOGRAPH: Kha Le in the Harvard-MIT Biomedical Engineering Center,
Professor Elazer Edelman, Director

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Report of the Ad Hoc Faculty Committee on Access to and Disclosure of Scientific Information

Appointed by the Provost and the Chair of the Faculty

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MASSACHUSETTS INSTITUTE OF TECHNOLOGY | JUNE 12, 2002

Executive Summary

INTRODUCTION

MIT has a long and distinguished record of public service. Our report documents past public service contributions and the policies that underlie them, but primarily it seeks to anticipate the challenges to MIT's mission that will arise from changing world conditions. The committee was established jointly by the Provost and the Chairman of the Faculty to examine MIT's policies dealing with restrictions on research, such as those arising from classified or industry-sponsored research. The committee's work was done at a time of change in laws governing access to materials and information and disclosure of research results that followed the events of September 11, 2001. Restrictions on access to select biological agents, the application of export control provisions to university researchers, and a growing pressure to treat research results as sensitive create a new landscape for faculty, students, and MIT as an institution.

CHARGE FOR THE COMMITTEE

The committee was asked to determine if our current policies provide adequate guidance to consider MIT's role in classified research in the context of the 21st Century. The committee was asked to address the following issues:

- Does the policy, as stated by Section 14.2 of *Policies and Procedures,* give the appropriate context for considering classified research on campus?
- While the policy differentiates between classified research at MIT Lincoln Laboratory and on campus, what are the implications for faculty and graduate student participation in research projects being conducted at Lincoln Laboratory when the research has a classified component? Under what conditions is such research acceptable?
- Section 14.2 of *Policies and Procedures* is specifically silent on the use of classified material on campus, as opposed to carrying out classified research. How should we interpret our policy with respect to the use of classified material on campus?
- As the industrial research base of MIT expands, issues can arise concerning the openness of this research on campus. How do our policies for dealing with this research, as agreed upon in research contracts and as practiced, comply with the values of the academic community?

MIT's current policy on research (Section 14.2) states, "It is the policy of the Institute, therefore, that every research project within the academic structure of MIT (excluding Lincoln Laboratory) that requires a classification on the research process, classification as to the source of funds, classification of the research results, or imposition of other restrictions on publication or access must receive the prior approval of the Provost." In the application of the policy since 1975 there have been no such approvals granted.

There are many issues that the committee did not consider. Our charge was centered on the issues of openness and access to research results as embodied in MIT's policies and practices and on possible changes to these. We did not deal with issues affecting individual faculty, as they consider how best to fulfill their public service responsibilities, or how they communicate their scientific findings through education or publications, or how they manage their laboratories and research groups, in so far as these do not conflict with MIT policy.

We did not consider MIT's involvement in a national debate about these issues. Nor do we recommend what mechanisms should be used to contribute to such a debate.

STATEMENT OF MIT VALUES AND PRINCIPLES

The fundamental mission of MIT rests upon four values: unfettered transmission of knowledge through educational activities, creation of new knowledge through research and other scholarly activities, service to the nation, and service to humanity. The Institute is committed to providing the highest quality education, to generating, disseminating, and preserving knowledge, and to working with others to bring this knowledge to bear on the great challenges facing our nation and the world in the 21st century.

We believe that MIT, to fulfill its mission, must have an open intellectual environment. Education and scholarship are best served through the unconstrained sharing of information and by creating the opportunities for free and open communication. Such an environment enables students to be exposed to the most current knowledge and allows scholars to build upon and to evaluate each other's work. National security, the health of our nation, and the strength of our economy depend heavily on the advancement of science and technology and on the education of future generations. The well-being of our nation will ultimately be damaged if education, science, and technology suffer as a result of any practices that indiscriminately discourage or limit the open exchange of ideas. Peer evaluation of research methods and findings, an outcome of open sharing and debate within the scientific community, is a crucial mechanism to insure the continued quality and progress of science.

Based upon these principles, we arrived at the findings and recommendations given below.

FINDINGS AND RECOMMENDATIONS

1 **CLASSIFIED RESEARCH ON THE MIT CAMPUS:** MIT remains committed to a strong role of public service and, as appropriate, to expanding the scope of that service. Such an expansion can include facilitating faculty members to serve the nation's national security needs within the framework laid out in our report.However, after examining the implications of conducting

classified research on campus, we conclude that retaining an open research environment with free flow of research results and information on the MIT campus is the best way for MIT to fulfill its public service responsibility.

Therefore, we recommend that no classified research should be carried out on campus, that no student, graduate or undergraduate, should be required to have a security clearance to perform thesis research, and that no thesis research should be carried out in areas requiring access to classified materials.

2 **STANDING FACULTY COMMITTEE TO MONITOR DEVELOPING RESTRICTIONS ON ACCESS TO AND DISCLOSURE OF SCIENTIFIC INFORMATION:** Currently, the Faculty Policy Committee has responsibility to consult with the Provost regarding exceptions to MIT policy regarding the conduct of research. We believe that the current situation requires more intensive attention than that committee can provide. Therefore, we recommend that a new standing faculty committee be established to monitor the evolving Federal legislation and MIT's response to these issues, as well as any exceptions granted to MIT policy for restrictions on access to and disclosure of research results, for both industry- or government-sponsored research. We also believe that this committee should monitor any issue of openness that comes to its attention arising from implicit arrangements made with sponsors that violate MIT's principles and go beyond contractual language.

3 **SENSITIVE AND OTHER RESTRICTIVE DESIGNATIONS:** Because there is no consistent understanding or definition of what would constitute "sensitive" information, MIT should continue its policy of not agreeing to any sponsor's contractual request that research results generated during the course of a program be reviewed for the inadvertent disclosure of "sensitive" information. Beyond this, MIT should not accept or hold any documents on its campus that are designated "sensitive" or "no foreign nationals," nor restrict any students from access to any course, on-campus seminar, or other similar forum. MIT should not designate any on-campus facilities as requiring special conditions for access beyond that required by existing legislation.

4 **SELECT AGENTS:** The recently enacted USA Patriot Act defines restricted persons and prohibits their possessing, shipping or transporting a number of select biological agents. At present, very few laboratories at MIT are affected by these regulations. However, the Secretary of Health and Human Services (H&HS) has been given special powers to expand the list of select agents and is likely to add agents to this list if pending bills are enacted.

The requirements involving personnel, students, faculty, and staff are not consistent with MIT's principles. It is likely that in the current climate, the number of agents on the list will grow and the restrictions placed on personnel, physical access, and publication of research findings may grow as well. At some point, MIT may rightfully decide that on-campus research in areas governed by these regulations is no longer in its interest or in line with its principles. We should consider applying a sunset clause to the acceptance of new contracts for research carried out under such restrictions, and the standing faculty committee should in the near future, reexamine our policies and practices in areas affected by these regulations.

5 **EXPORT CONTROLS:** MIT and its faculty are affected by laws governing export of scientific information and artifacts. Since most fundamental research enjoys an exemption from the need to seek export licenses prior to disseminating information or items, open communication in all of its aspects is the best means to insure that research results can be freely communicated. MIT should insure that the designation of fundamental research and public domain extends to as much of its ongoing research activity as possible, consistent with the national interest. Any formal or contractual restrictions on the open sharing of research results eliminate a project's fundamental research and public domain exemptions. Such restrictions should be accepted only after careful analysis of their effects upon MIT and its research program. The administration of MIT should insure that faculty members understand their obligations under these export control laws.

6 **FACULTY PARTICIPATION IN CLASSIFIED RESEARCH:** Issues arising from the participation of faculty members in off-campus classified research as an extension of on-campus research can be handled within the current framework of MIT policy. First, faculty members need to keep department heads notified about the extent of a research activity that may for a time remove the faculty member from active contact with students. Second, the Provost must be informed about activities that involve MIT in complex relationships with other organizations. Without such notification, it is likely that administrators will be unaware of the relationships that can significantly affect MIT research. We believe that such notification should be given at the initiation of a project, not just in the annual report from faculty.

There exist several organizations that can provide access to classified facilities to enable MIT faculty to carry out the classified portions of their research. The most prominent of these is MIT's Lincoln Laboratory, but several other organizations could also provide such access.

7 **LINCOLN LABORATORY:** The management and oversight of Lincoln Laboratory are major components of the public service that MIT carries out for the nation. In its oversight role, MIT should continue its active management of Lincoln Laboratory to insure that: the research meets MIT standards for independence and quality, and in so far as possible, Lincoln provides an environment that enables faculty to do research with national security implications.

8 **RELATIONS WITH OTHER LABORATORIES:** MIT and its faculty have ongoing relations with a number of independent defense-supported research laboratories such as Draper Laboratory, Air Force Research Laboratory, Natick Army Laboratory, and the Naval Undersea Warfare Center in Newport, R.I.. These facilities offer opportunities to strengthen our activities in research that have applications to national security. In particular, MIT should strengthen its relationship with Draper Laboratory and have access to Draper as an off-site facility for research and administrative support for faculty requiring access to classified material.

9 **EXTRAORDINARY EVENTS:** There may be times when rapid near-term access to specialized MIT on-campus facilities and expertise will be required by the nation. Examples of this would be the need for forensic analysis of biological materials, materials preparation, and the use of other facilities and expertise for significant national purpose other than research. Providing this type of assistance may require special procedures for restricted access. We believe that MIT should make such expertise available for a short-time response with a time-definite sunset clause. An MIT response to such emergencies would require the permission of the Provost in consultation with the standing faculty committee we have recommended.

10 **INDUSTRY-SPONSORED RESEARCH:** Our committee has not been able to address all of the issues raised by industry-sponsored research. We therefore recommend that the standing faculty committee we have suggested review MIT policies in this area, as well as their specific application in practice, as one of its first agenda items. We are concerned about growing pressures affecting the openness of research results and their publication that arise from involvement in industry-sponsored research. We are also concerned that restrictions on openness may undercut the fundamental research exemption in the export control regime.

11 **RESEARCH CONDUCT:** MIT should incorporate in *Policies and Procedures* explicit statements about acceptable research behavior and clear standards for the conduct of research to insure that implicit agreements are not reached with research sponsors that violate MIT's policies on openness and access. Such guidelines should be incorporated into the material that accompanies the annual report that faculty make, detailing their outside professional activities and their on-campus research relationships.

12 **FACULTY ACCESS TO CLASSIFIED RESEARCH AND MATERIALS:** MIT faculty play important public service roles in areas requiring access to classified materials. To support these activities we recommend that MIT hold security clearances for faculty who require them, and provide off-campus facilities to allow access to classified materials needed to engage in research or public service.

We do not recommend that MIT provide facilities for storage and access of classified materials on the MIT campus. An off-campus site should be provided for faculty to use such material, as required, utilizing the facilities of Lincoln or Draper Laboratories.

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Service To The Nation: A History of Research and Research Policies

1.1 FOUNDING AND EARLY DAYS

From the time when William Barton Rogers articulated a vision for the Massachusetts Institute of Technology in 1861, there was a commitment that this new institution should serve the community. "We believe that the great practical value of the results at which we aim…must be recognized with especial heartiness in a community like our own…and we feel assured that the magnitude of the plans [will] secure these great public benefits." (Objects and Plan of an Institute of Technology, 1861).

1.2 WORLD WAR II: THE RADIATION LABORATORY

During the Institute's first eighty years, the fulfillment of that public service mission took many forms: consulting, committee memberships, and special research efforts. But it was MIT's response during the Second World War that contributed so significantly to the nation's needs, and at the same time transformed the Institute. In May 1940, anticipating that MIT "would be called upon to take part in national preparedness," Karl T. Compton, then President of MIT, wrote to all department heads asking them to suggest "in which ways the staff and facilities of your department might be most advantageously used in such an emergency." The magnitude of the Institute's response is chronicled in John Ely Burchard's *Q.E.D.; MIT in World War II* (New York: J. Wiley, 1948).

The largest single effort undertaken by MIT during the war was the Radiation Laboratory. The name was chosen to mask the true purpose of the lab, which was to develop microwave radar systems for aircraft, ships and anti-aircraft guns. Under the leadership of Vannevar Bush and the NDRC (National Defense Research Committee), the decision was made to house the radar laboratory (Rad Lab) at a university in contrast to a defense or industrial site. At the time, this was a novel idea, but the decision to place government-funded laboratories at universities clearly set the pattern for the post-war years.

MIT was chosen as the site for the Rad Lab as research was already underway in these areas and the Institute was willing to make space available for this purpose. MIT originally allocated 10,000 square feet of space and a staff of 50 persons. By the end of the war the laboratory occupied 15 acres of office space, had a staff of nearly 4000, an annual budget of $13 million, and

had produced over one hundred different radar systems and devices. The Rad Lab was run as a secure facility where all work was classified as secret. Staff members were investigated by the FBI before they were granted a security clearance, and were then required to sign secrecy agreements. Visitors to the facility were carefully controlled.

The Rad Lab not only brought outstanding scientists and engineers into the MIT community, but it also contributed to the education of future generations. The effort made at the end of WW II, to record and disseminate the knowledge gained by the Rad Lab staff reflects the continuing commitment to communicate research results as rapidly and as widely as possible. I.I. Rabi, one of the key scientists at the Laboratory, suggested the publication of a series of volumes to capture the advances that had been made by the staff in such areas as crystal theory, antenna development, radio signal propagation work, and general microwave circuitry. The end result was the twenty-eight volumes of the *Radiation Laboratory Series*. "The series, beginning with the volume *Radar Systems Engineering*, would debut in 1947 and go on to serve as the occupational bible and textbooks for at least a generation of physicists and engineers studying microwave electronics" (Robert Buderi, *The Invention That Changed The World* [New York: Simon & Schuster, 1996], p. 251).

James R. Killian Jr., President of MIT from 1948-59, has written that the Radiation Laboratory "bequeathed to their members a realistic sense of the importance of further contributions to our national security after the war…Professor Jerrold Zacharias has made the interesting comment to me that this sense of realistic involvement, which marked the work of the Radiation Laboratory group, led to the initiation of programs…organized in the 1950's to reform and improve the teaching of science in pre-college schools" (James R. Killian, Jr., *The Education of a College President* [Cambridge, MA: The MIT Press, 1985], p. 27).

At the end of the war, the Rad Lab was quickly dismantled, and the basic research component became MIT's Research Laboratory for Electronics (RLE). Through the 1950's the armed services remained the primary source of funding for RLE. At first the research program was predominately unclassified, but over time RLE undertook more classified work though the laboratory remained open to graduate students.

From the end of WWII through the 1960's, classified research was conducted at several other MIT locations. In addition to RLE, the Instrumentation Laboratory and Lincoln Laboratories, discussed below, some classified work was conducted at the Center for International Studies (CIS). During the 1960's, the faculty in the CIS decided that classified research in the social sciences had significant negative consequences, and decided to phase out all classified projects. The last room that held classified files in the Center was dismantled in 1972.

1.3 THE INSTRUMENTATION LABORATORY

"The Instrumentation Laboratory of MIT was firmly rooted in the work of one individual, Charles Stark Draper" (Roslyn Romanowski, *Peacetime to Wartime* [MIT B.A. thesis, Humanities, 1982]). While a graduate student at MIT in the late 1920's, Draper was invited to teach a course on aircraft instruments, thus beginning his long career in the development of inertial guidance systems.

When the Instrumentation Laboratory was established in the 1930's, initial funding came from the Sperry Gyroscope Company. Subsequently, the Laboratory began to investigate gyroscopic guidance for anti-aircraft guns and the primary funding shifted to the government. During World War II the laboratory, known during the war as the Confidential Instruments Laboratory, made significant contributions to defense needs with the Mark-14 gunsight being one of the major developments during the war. (David Mindell, *Between Human and Machine: Feedback, Control, and Computing Before Cybernetics* [Baltimore, MD: The Johns Hopkins University Press, 2002]).

In the post-war years, Draper and the staff of the Instrumentation Laboratory developed guidance systems for strategic ballistic missiles, working on the guidance systems for both the Polaris and Titan projects. Before 1961 almost all research contracts were funded by the military. When the Laboratory was awarded the NASA contract to develop the navigation and guidance systems for Apollo, the mission to the moon, the funding became approximately evenly divided between military and civilian sources. While the military work remained heavily classified, the Apollo project itself was unclassified at the insistence of NASA, although it drew heavily on technologies developed for the military. The Laboratory had a "thesis declassification officer" until the late 1960's.

1.4 SUMMER STUDIES AND THE ESTABLISHMENT OF LINCOLN LABORATORY

In the 1950's several federal agencies turned to MIT to explore issues of importance to the nation's defense. The initial request from the AEC (Atomic Energy Commission) to explore the feasibility of nuclear powered flight (Project Lexington) led MIT to establish the summer studies format as an intense and effective way to rapidly carry out investigative projects. MIT gathered scientists and engineers from around the country and asked them to consider a problem of significant scope and importance. Project Lexington demonstrated the strength of the summer study format, but also the importance of properly framing the question. Professor Jerrold Zacharias, the director of the second study, Project Hartwell, broadened the Navy's original request to "find new ways of detecting submarines," to the question of the security of overseas transportation and harbor defense.

After the end of the war, President Killian stated that MIT "was understandably reluctant to undertake the establishment of a large research laboratory devoted to military objectives, having devoted itself so intensively to the conduct of the Radiation Laboratory and other large war projects." (James R. Killian, Jr., *The Education of a College President* [Cambridge, MA: The MIT Press, 1985], p. 71).

In 1950, however, responding to a request from the Air Force, President Killian recommended a summer study, named Project Charles, to explore the feasibility of establishing a major laboratory focused on air defense. MIT was motivated to take on the study both by national defense needs, and also the understanding that such a laboratory would act as a stimulus for the small electronics industry in the area.

The summer study recommended the establishment of a laboratory, named Project Lincoln, to be operated by MIT for the Army, Navy and Air Force. In agreeing to establish the Laboratory

President Killian wrote to Thomas Finletter, then Secretary of the Air Force, "I wish to be very explicit in saying that MIT is anxious to do what is in the public interest in this matter…that in writing to you…I am asking that there be…an effort…to get concurrence that [our continuation] is in the public interest and justifies…the severe problems…it imposes on an educational institution" (James R. Killian, Jr., *The Education of a College President* [Cambridge, MA: The MIT Press, 1985], p. 73).

Continuing funding was assured by the Air Force in 1953, and construction of the new facility near Hanscom Field in Bedford, Massachusetts was completed at that time. A site off-campus was sought as there was limited space for classified research on campus, and "President Killian believed that MIT should not be carrying out classified research on the Cambridge campus" (*MIT Lincoln Laboratory: Technology in the National Interest* [Lexington: Lincoln Laboratory, 1995], p.11). Classified work, previously conducted at the RLE, was transferred to Lincoln Lab.

In the early years, the most important developments to come out of Lincoln Lab were SAGE (Semi-Automatic Ground Environment), a nationwide network of radar and anti-aircraft weapons linked to digital computers, and the DEW (Distant Early Warning) Line, a radar surveillance system placed along the polar gateway to the United States. Though operated as a classified facility, Lincoln has supported graduate student work that has resulted in many theses.

1.5 RECONSIDERATION OF THE SPECIAL LABORATORIES: THE POUNDS PANEL

Concerns about the Instrumentation Laboratory and Lincoln Laboratory were always present, as were the implications of the growth of their sponsored research programs. Over the years, MIT's Visiting Committee on Sponsored Research addressed these issues repeatedly. Their 1965 report stated, "It is in these two areas [of Lincoln Laboratory and the Instrumentation Laboratory] that the most serious problem of controlling the natural tendency to expand resides, and in which interaction with the educational process automatically becomes obscure. We therefore repeat the cautions set forth by previous Committees, warning against unwarranted growth and emphasizing the need for an appropriate balance between meeting obligations to the Government on the one hand, and to the Institute's educational objectives on the other."

In 1956, and again in 1963, the Institute discussed altering or severing the relationship between MIT and the two laboratories, but no changes were made. In 1969, in the midst of the war in Vietnam, the reconsideration of the special laboratories took on greater urgency. On March 4, 1969, a group of MIT faculty and students organized a stoppage of research to "provoke a public discussion of problems and dangers related to the present role of science and technology in the life of our nation" (*Science* [163, January 24, 1969], p. 373 and [163, March 14, 1969], pp. 1175-1178). The protest was devised as a "means for turning research applications away from the present emphasis on military technology toward the solution of pressing environmental and social problems."

Responding to growing protests at MIT and other college campuses, then President Howard W. Johnson convened a Review Panel on Special Laboratories to reconsider the status of the Instrumentation Laboratory and Lincoln Laboratory. William F. Pounds, then Dean of the Sloan School of Management, chaired the panel. The first report, issued by the Panel in May 1969 and

the final report, issued in October 1969, recognized the very different histories of the laboratories, but suggested that "MIT's non-academic public service…should be diversified by including a considerably larger non-military component devoted to the major problems of society." (First report, p. 8). The report made four recommendations:

- The laboratories and MIT should explore new projects to provide a more balanced research program.
- The educational interaction between the special laboratories and the campus should be expanded.
- There should be intensive efforts to reduce classification and clearance barriers in the special laboratories.
- A standing committee on the special laboratories should be established.

The Panel examined several controversial projects, including the Poseidon missile at the Instrumentation Laboratory and the MTI (Moving Target Imagery) radar at Lincoln Laboratory. A standing committee was formed with the charge of continuing to review the programs of the special laboratories.

Protests continued at MIT throughout 1969 while the Institute weighed the conflicting recommendations and financial implications of retaining or divesting the special laboratories. The Executive Committee of the Corporation issued a "directive that barred new work related to systems intended for operational deployment as military weapons." On May 20, 1970, President Johnson announced, "MIT can continue to manage Lincoln Laboratory in essentially the same frame as we have in the past and foreseeable future…[but] we cannot continue to take that responsibility for the Draper Laboratory under the restriction of the Corporation Executive Committee's directive." Although the recommendation had severe financial consequences for the Institute, the decision was made to divest the Instrumentation Laboratory. The Laboratory was renamed for its founder, Charles S. Draper, in 1970 and remained a part of MIT until 1973 when it became an independent, not-for-profit research and development corporation.

1.6 THE ROLE OF FUNDAMENTAL RESEARCH IN TECHNOLOGY TRANSFER IN THE 80'S: NSDD 189

As a reaction to the worsening relationship between the United States and the Soviet Union in the late 1970's, new restrictions were imposed on the American academic scientific and engineering communities. For the first time, the Export Administration Act was used to restrict access by foreign nationals to scientific meetings, and to prohibit the presentation and publication of work that had not previously been restricted. In February 1981, the presidents of five research universities, including MIT, wrote to the Secretaries of Commerce, State and Defense, to indicate that they were "deeply concerned about recent attempts to apply to universities the International Traffic in Arms Regulations (ITAR), and Export Administration Regulations (EAR)."

In February 1982, a DOD-University Forum, co chaired by Richard DeLauer, then Under Secretary of Defense for Research and Engineering, and Stanford President Donald Kennedy, was established to encourage communication between the academic and defense communities. And in March 1982, the Committee on Science, Engineering, and Public Policy (COSEPUP), of the National Academy of Sciences, convened a Panel on Scientific Communication and National Security chaired by Dale R. Corson, physicist and president emeritus of Cornell University. The Corson report concluded that, while there was a significant amount of technology transfer to the Soviet Union, very little of this problem was caused by the academic community. The report stated that "The long-term security of the United States depends in large part…on the vigorous research and development effort that openness helps to nurture."

In 1984, when the DOD proposed contract provisions that would have authorized their reviewers to restrict the publication of some research findings, the presidents of MIT, Caltech, and Stanford notified the White House that if these provisions were enacted, their institutions would refuse to conduct sensitive but unclassified research. Richard DeLauer supported the position taken by the academic community, indicating that "consistent with existing statutes, no controls other than [security] classification may be imposed on fundamental research and its results when performed under a federally supported contract."

In response to the COSEPUP study and continued efforts to control access to research and dissemination of the findings, the Reagan administration issued National Security Decision Directive (NSDD) 189, "National policy on the transfer of scientific, technical and engineering information," in 1985. NSDD 189 sets forth the definition of fundamental research, and the policy that when restrictions are necessary, security classification should be used.

> 'Fundamental research' means basic and applied research in science and engineering, the results of which ordinarily are published and shared broadly within the scientific community, as distinguished from proprietary research, and from industrial development, design, production, and product utilization; the results of which ordinarily are restricted for proprietary or national security reasons.
>
> It is the policy of this Administration that, to the maximum extent possible, the products of fundamental research remain unrestricted. It is also the policy of this Administration that, where the national security requires control, the mechanism for control of information generated during federally-funded fundamental research in science, technology and engineering at colleges, universities and laboratories is classification…No restriction may be placed upon the conduct or reporting of federally-funded fundamental research that has not received national security classification, except as provided in applicable U.S. Statutes.

1.7 MIT POLICIES DEALING WITH RESTRICTIONS ON RESEARCH

MIT policy development, with respect to classified research and other restrictions on openness in research, tracked the changes described above. These various policies are included in Appendix B, which also contains a statement of current MIT policy.

2

Developing Concerns on Access and Control of Scientific Information

The end of the Cold War did not end concerns about threats to national security, or stop the evolution of government-university relations. On the contrary, reflections on the Cold War experience heightened awareness among the nation's political leaders of the important role science and technology played in America's success. The advantage held by the United States in military relevant technologies was in large part achieved through an effective collaboration in science and technology between the military and private sector institutions, including academic institutions. This significant and growing edge is often said to have undermined the Soviet Union's confidence in its ability to compete with the West on any grounds and, therefore, to have hastened the end of the Cold War.

The sophistication of a nation's military technology thus became for many officials the key measure of relative military strength. With it came a belief that the United States must create and hold a lead over all other nations in military relevant technologies. The fact that many of the technologies most important to our defense are inherently dual use, in the sense that they have significant commercial as well as military value, greatly complicates efforts to protect leads. Satellites can monitor crop production as well as troop movements; work in biotechnology may produce cures for disease as well as lethal weapons. The effort to build military advantage can easily conflict with the desire to expand trade and gain economic advantage.

With the end of the Cold War, worries about the proliferation of weapons of mass destruction and related delivery systems escalated. During the Cold War, it was in the interest and, to a large extent, the power of both the United States and the Soviet Union to limit the diffusion of weapons of mass destruction. Each superpower had a network of allies in which offers of protection and threats of abandonment contained the desires for others to possess their own arsenals of such weapons. The end of the Cold War has meant not only the possible theft or sale of weapons from the Soviet stockpile, but also heightened interest in the acquisition of weapons of mass destruction by nations whose security guarantees expired with the Soviet Union, or who wished to challenge American power on their own.

The September 11th and subsequent attacks on the United States have taught also that common technologies can be used for deadly purpose. A large aircraft becomes a bomb in the hands of terrorists. Mail-sorting machines can spread the contents of an anthrax-contaminated letter. These events have raised concerns about who gets trained in what techniques even if the techniques are not secret or reserved only for the military.

From a security point of view, the increasing international visibility and accessibility of America's universities is a complicating development. On the one hand, the prominence of our universities draws many of the world's best minds to the United States as teachers, researchers, and students. We are richer in all aspects of our lives, including defense, for the knowledge they generate. Many will return home to become leaders in their own countries, carrying with them a good measure of American values and understanding, and building a stronger world. On the other hand, because of their openness, the universities become a gateway through which potential enemies may access advanced technologies, even common ones, that can be used in military systems to our detriment. Research collaborations and educational exchanges that look entirely beneficial from some perspectives may look quite dangerous from others.

Both the Executive Branch and the Congress have expressed concern in recent years about the leakage of vital technologies to hostile regimes or groups. Some lower-level federal research administrators, sensing the changing political climate, have begun to tighten or expand their interpretation of security regulations. One serious result has been the attempt by agencies to claim that restrictions should be placed on access to certain information they label as "sensitive" even though this information has not been classified as secret through established procedures. Thus, universities like MIT, that have policies against doing classified research on their campuses in order to preserve their openness, have found themselves facing pressure from federal research sponsors to control access to and limit dissemination of some research findings.

International Traffic in Arms Regulations (ITAR) governs the export of technologies and products on the U.S. Munitions List and is administered by the State Department. Although the list of technologies covered by the Munitions List is broad, most university international collaborations and exchanges are excluded from ITAR license requirements under a general exemption for public domain information or fundamental research. ITAR defines fundamental research as research in science and engineering at a U.S. institution of higher learning, the results of which are published without restriction. However, there are some fields like space research where even fundamental research requires the utilization of technologies that may be considered to be defense related. In fact, recent tightening of ITAR's administration stemmed from concern about the transfer of space technologies to China in commercial transactions. Finding a way to preserve international collaborations and exchanges in the space sciences has been difficult, and the field is somewhat in turmoil because of this. Recent amendments to ITAR (March 29, 2002), intended to help the universities, have improved the situation somewhat by exempting from the license requirements certain exports to nationals from NATO and a small number of allied countries. The changes are limited in their applications and have not solved the basic difficulties. The fundamental research exclusion has not become more flexible and predictable. At the same time, some new problems have been created, such as inadvertently requiring discrimination among students according to country of origin. Moreover, the dual-use nature of science and technology raises the concern that ITAR restrictions will be extended to many other fields.

Export controls present particular problems for the universities in that the transfer of some scientific information included in normal domestic research activities, like the employment of graduate students, the conduct of workshops and seminars, or the transmission of papers when they involve foreign nationals from other than NATO countries, can be in violation of the regulations. These "deemed exports" of potentially sensitive information are troublesome to manage for university researchers and administrators because the activities are an inherent part of the academic research process, yet can place them in legal jeopardy including the imposition of criminal penalties.

Regulations governing access to and the handling of hazardous materials have been strengthened after the September 11th attacks and the anthrax letters. Although most of the pre-existing controls were directed toward environmental safety concerns as well as preventing misuse of hazardous biological materials and toxins for terrorism, the latter purpose has gained prominence in new law. The USA Patriot Act, signed October 2001, although involving much else including expansion of the government's ability to monitor communications networks and seize electronic records, prohibited the involvement of individuals deemed restricted persons from possession, shipping, transport, and receipt of covered select agents that could be used in biological attacks.

Biology and bioengineering now join other academic fields such as space and computer sciences in which security pressures are likely to test the health of university-government relations. Law enforcement and the military worry that the openness of the academic environment, without intention, will allow those who wish to harm Americans to gain the materials and information needed to do so. The universities fear that the processes that make American academic science and engineering so productive for defense and everything else in society will be sacrificed in the false belief that openness per se is the danger.

Opposition, even to the point of questioning the understandable desires for security and the restrictions that it involves for academic life, is going to be very difficult. Public support for the campaign against terror is high. No one wishes to increase the risk that additional deadly attacks will occur. Academic research after the Cold War remains financially dependent upon federal research contracts and grants. For most research universities, it is health-related research rather than defense-related research that now attracts most support, but the vulnerability to federal mandates created in the last half century is unchanged. Only dialogue and a partnership between the Federal Government and universities to identify the real needs of government to strengthen security, balanced with the public service contributions of the universities in all of its aspects, will likely preserve all the academic freedoms that remained in force and were so productive during the long years of the Cold War.

3

Responsibilities and Restrictions on the Handling of Scientific Information

In its role as a major research university, MIT as an institution and MIT faculty as individuals are bound by a framework of laws and regulations pertaining to the handling of scientific information and research materials. Some of these obligations derive from the choices that MIT has made to perform industry-sponsored research or to perform classified research at Lincoln Laboratory. Others flow from laws controlling access to and dissemination of scientific information and research materials that apply to everyone. Many of these laws place special burdens on institutions and faculty in particular research fields, and govern the handling of particular substances or particular technologies. Recent legislation has expanded the restrictions and the responsibilities of institutions and individuals. It is important that MIT faculty understand their obligations under these laws and regulations. The MIT administration should play a primary role in insuring that the MIT community is well informed on these issues.

3.1 CLASSIFIED RESEARCH

Classified research has a well-defined set of governing laws and regulations. The obligations of the Institution and the individuals engaged in classified research are well understood. Criminal penalties result from violations of these laws.

MIT currently undertakes classified research at Lincoln Laboratory, an FFRDC (Federally Funded Research and Development Center) specializing in radar and electronics.Governance and oversight issues require, that to fulfill its institutional obligations, senior MIT officials must have appropriate security clearances. Currently, only fifteen main campus individuals are required by the government to have security clearance: President, Provost, Vice Presidents and the Executive Committee of the Corporation. MIT maintains a facility security office on campus to fulfill its obligations.

Classification requirements flow from specific relationships with government agencies and contractual agreements. Beyond Lincoln employees, senior MIT administrators, and a few individual MIT faculty who have research relationships with Lincoln, no other MIT faculty hold their security clearance through MIT or through their association with Lincoln Laboratory. We estimate that there might be as many as seventy-five members of the MIT faculty who currently hold security clearances. But as such clearances must be related to specific government contracts and/or specific relationships with government agencies, these MIT faculty members have their clearances held by other organizations such as DOE, NRO, and USAF.

For many faculty members, these clearances are an important enabler of their public service. For example, serving as a committee member or reviewer for an unclassified National Research Council study on the Nuclear Test Ban Treaty required access to classified material. Since obtaining a clearance can take up to eighteen months, responding promptly to public service opportunities is not possible without provision for the continuity of individual security clearances.

Although classification flows from contractual requirements freely entered into, there are some situations in which unclassified research becomes classified by what could be termed "march-in rights." In such cases, findings obtained in unclassified research have been deemed by the government to be of such overwhelming importance to national security that the results are classified after the fact, often removing them from the faculty member's control or participation. These actions by the government have affected faculty access to their research as well as student thesis research and publications. To date, these have been extraordinary events.

However, in the current climate, we may see a desire on the part of contract monitors to more closely oversee the ongoing research with a goal of imposing classification on emerging research results. To be acceptable, we believe that any such actions would be extremely rare and would require great sensitivity and care to avoid damaging the process of discovery.

3.2 SENSITIVE INFORMATION

Increasingly of late, MIT has seen the attempt by government contracting officials to include a requirement that research results be reviewed, prior to publication, for the potential disclosure of "sensitive" information. Such a request implies potential restrictions on the manner in which research results are handled and disseminated, and may also restrict the personnel who have access to this material. The difficulty with this approach is that the term "sensitive" has not been defined, and the obligations of the Institute and the individuals involved have not been clarified nor bounded. This situation opens the Institute and its faculty, students, and staff to potential arbitrary dictates from individual government contracting agents—however well intended. We are aware that many universities have had similar experiences.

To date, MIT has refused, in all cases, to accept this restriction in any of its government contracts. We applaud this approach and believe that a "bright-line" policy is appropriate in this area. MIT has chosen to engage in classified research at Lincoln Laboratory under well-defined obligations but does not, and should not, accept arbitrary restrictions on its research environment.

The government may place other restrictions on scientific information that affects national security. The designation "No Foreign Nationals" is often placed on scientific and technical material, and access to such materials and meetings discussing them is restricted. Clearly, such restrictions are not compatible with the educational environment at MIT.

3.3 EXPORT CONTROLS

An area of growing concern is the application of the International Traffic in Arms Regulations (ITAR) and Export Administration Regulations (EAR) to fundamental research undertaken by universities. Major problems have arisen for research universities involved in the space sciences,

and concerns have been expressed that these restrictions will soon spread to many other fields. ITAR concerns itself with the export of military-critical technologies listed on the U.S. Munitions List (USML) and related "defense services" including instruction. Commercial and scientific satellites are included on the USML. EAR concerns itself with technology, equipment, software, and information on the Commerce Control List for commercial as well as "dual use," i.e., commercial use with some military potential. It is important that faculty understand their personal responsibilities under ITAR and EAR as violations carry criminal penalties.

Fundamental research is excluded from the application of ITAR and EAR. The definition of fundamental research is basic and applied scientific research at a U.S. university, the results of which will be published and disseminated without restriction, whether the restrictions come from government or corporate sponsors. The designation "sensitive" in contract language, if it implies some restriction on publications, might subject the research results to ITAR or EAR licensing requirements. We have not analyzed the effect of corporate restrictions in industry-sponsored research on ITAR application. However, if a contract has any limitations on the dissemination of research results and the technology is listed on the ITAR or EAR lists, then licensing is required under ITAR and may be required under EAR.

Even when a project might be seen as falling under the fundamental research or public domain exclusion, another part of the ITAR mandates that a license is required when there is provision of "defense services," a kind of catch-all regulation defined as providing assistance, including training, to foreign nationals in the use of "defense articles," (those items on the Munitions List). This provision includes the design, development, engineering, manufacture, testing, operation, demilitarization, destruction, processing or use of defense articles. Any "technical data" relating to these is also included. In fact, the ITAR is a complex document, at times internally inconsistent, and in any case requiring legal interpretation.

3.4 USA PATRIOT ACT: SELECT AGENTS

Following the events of September 11th, Congress passed legislation that controls the possession, receipt, shipping, or transport of certain select biological agents on the part of "restricted" persons. As of now, the Act will only affect the work of very few laboratories at MIT. However, under some of the bills pending in Congress, the Secretary of Health and Human Services (H&HS) is likely to expand the list of select agents. The expanded list could have a much greater impact on MIT, particularly on areas that do biological research. Additional security, training, and physical restrictions on access to facilities will be required to comply with the Act.

The existing Patriot Act applies the obligations and criminal liabilities for violations to individuals. Pending bills in Congress would extend the liabilities for violations to institutions as well. Under the Act, in addition to certain foreign nationals, United States citizens who have been dishonorably discharged, indicted, or convicted for certain crimes, are illegal drug users, are fugitives, or who have had a mental illness will also be restricted. It is not clear who will be required to conduct background checks and be liable for the results. At the present time, MIT faculty and staff, working with these select agents, are being given a self-assessment form to help them determine if they are legally able to work with these materials, and to notify them of the implications.

If bills pending in Congress are enacted, the Secretary of H&HS could promulgate regulations with the effect that laboratories handling these select agents would have to be physically restricted. These bills, if enacted, would also impose obligations on institutions to identify and prevent "restricted persons" from having access to select agents. In such event, the problems of complying with this legislation will be very similar to those for classified research.

3.5 INDUSTRY-SPONSORED RESEARCH

MIT does not accept restrictions from corporate sponsors on the free dissemination of research results, with the exception of minor delays to protect the potential for obtaining a patent or to protect the inadvertent disclosure of proprietary information. MIT policies govern the handling of proprietary information and the acceptable delays for publication of industry-sponsored research results. These are discussed in Section 9 of our report.

3.6 OTHER RESTRICTIONS

We understand that occasionally members of the MIT faculty feel pressured to make implicit agreements with research sponsors, both government and industry, that violate MIT's principles of openness and access, and bypass the requirements that appear in the research contract. Such implicit agreements are usually seen as necessary to secure funding and are often designed to restrict access to research results, or to insure special or early access to research that would eventually be in the public domain. These pressures can also take the form of suggestions about the suitability of individual graduate research assistants, as viewed by the sponsor, or restrictions on the accessibility of research findings to students or members of the faculty. Although we can understand the pressures on faculty to make such handshake agreements, such agreements undercut MIT's principles of openness and access, and can have unforeseen consequences, such as eliminating the fundamental research exemption, which excludes research results from export controls or other restrictions.

In the present climate, we can expect such pressures to increase both from government and industry sponsors. As part of our recommendations, we have called for the establishment of a standing faculty committee to monitor a variety of developing issues and challenges in the application of MIT policies to specific situations. We suggest that this new committee serve as a forum to discuss concerns that faculty members and students have about unwritten restrictions on openness and access to research results.

We also recommend that in *Policies and Procedures*, MIT should make explicit that the policy on the conduct of research discourages such implicit agreements. Information about this issue should be included in the material that accompanies the annual report for individual faculty on outside professional activities.

4

Statement of MIT Values and Principles

The fundamental mission of MIT rests upon four values: unfettered transmission of knowledge through educational activities, creation of new knowledge through research and other scholarly activities, service to the nation, and service to humanity. The Institute is committed to providing the highest quality education, to generating, disseminating, and preserving knowledge, and to working with others to bring this knowledge to bear on the great challenges facing our nation and the world in the 21st century.

To fulfill its mission, MIT must have an open intellectual environment. Education and scholarship are best served through the unconstrained sharing of information and by creating the opportunities for free and open communication. Such an environment enables students to be exposed to the most current knowledge and allows scholars to build upon each other's work. National security, the health of our nation, and the strength of our economy depend heavily on the advancement of science and technology and on the education of future generations. The well-being of our nation will ultimately be damaged if education, science and technology suffer as a result of any practices that indiscriminately discourage or limit the open exchange of ideas. Peer evaluation of research methods and findings, an outcome of open sharing and debate within the scientific community, is a crucial mechanism to insure the continued quality and progress of science.

Openness enables MIT to attract, educate, and benefit from the best students, faculty and staff from around the world. This is especially important as competence in science and technology has grown throughout the world so that access to research and knowledge outside the United States is critical to our own progress. Over the course of many years, immigrant scientists as well as foreign visitors and students have contributed enormously to the American educational and scientific enterprises. They have enriched our knowledge and culture, promoted the growth of our economy, have become essential contributors in American companies and research laboratories, and have improved the quality of our lives. Many will return to their home countries to become leaders with an understanding of our nation and our values. No foreign national granted a visa by the United States government should be denied access to courses, research or publications generally available on campus.

Freedom to publish is an inherent and necessary component of the progress of science. Scientific results require replication or falsification for their acceptance or rejection. Thus scientific results published without the details of experimental procedure and methodology do not in fact constitute science. Although some have suggested such restrictions on the flow of scientific information, it is clear that such a policy would severely damage science.

5

Classified Research at MIT

The rationale for conducting classified research at MIT flows directly from our institutional commitment to public service. MIT stands ready to assist the nation in applying its expertise to the most pressing national issues—it has done so in the past, it is doing it now, and it will do so in the future. We believe that public service is the only rationale for conducting classified or otherwise restricted research at MIT. Other possible rationales for accepting restrictions on access to and dissemination of research results, for example, individual career enhancement, available funding, the progress of science, access to the best technology, or individual patriotic desires, can be satisfied by other means and do not justify accepting restrictions on on-campus research. Our commitment to public service may also require that, under extraordinary circumstances, the Institute will make specialized knowledge available and provide access to specialized facilities. Such activities would be a short-term response to critical national emergencies, as opposed to undertaking research.

The principal mission of MIT is education and research involving faculty and students. To carry out this mission MIT maintains a variety of facilities. When we speak of MIT's campus the contiguous group of buildings in Cambridge comes to mind. However, MIT has education and research facilities at other sites. A definition of on-campus, therefore, must be carefully developed before we move to a discussion of the restrictions on openness and access to research that will and will not be appropriate for our "campus." We do not believe we can give a definition of on-campus that will be valid for all time. When we speak of campus, we will mean the physical facilities in which education and research involving undergraduate and graduate students takes place. We assume that all MIT facilities are included in the definition of campus unless specifically excluded by the Provost, in some cases in consultation with the standing faculty committee that we recommend. Since Lincoln Laboratory performs classified research and has controlled access, it is not included in the definition of on-campus.

The impact of on-campus classified research on the educational and research mission of MIT is distinct from the impact on MIT's mission of classified research conducted at Lincoln Laboratory in Lexington, or elsewhere, by MIT faculty or Laboratory staff. In the future, MIT may see the need to establish additional facilities in which classified research could be conducted to carry out research in other scientific areas, such as the biological and health sciences.

However, we believe it is appropriate to examine what would be the fundamental rationale for conducting classified research at a university such as MIT. The principal argument is that universities serve as an effective incubator for carrying out important work in emerging areas. The ability to attract highly qualified personnel and gain access to extraordinary research equipment and expertise are the principal reasons. Examining the history of Lincoln Laboratory and the many other organizations still in existence that have been spun off by MIT, and interviewing Lincoln Laboratory personnel, we find that there is considerable value to the nation from setting up such relationships in a university setting.

However, our belief in our responsibility to conduct classified research in the public interest at facilities like Lincoln Laboratory is a separate question from the implications of conducting classified research on the MIT campus. Several arguments could be advanced to support carrying out classified research on MIT's campus in addition to that carried out at our off-campus facilities. Among the arguments would be:

1. To perform a service to the nation on important national security matters where:
    a. MIT has substantial expertise and technical capabilities to offer in seeking solutions.
    b. MIT may be able to contribute substantially to developing national policies and strategies vital to national security by drawing on information on the latest developments in science and technology.
2. To act as an effective technology transfer mechanism to disseminate the fruits of MIT research to United States defense and non-defense contractors, thereby improving their capabilities.
3. To provide alternative technical and scientific judgments on important national matters that currently are provided by MIT only through Lincoln personnel conducting research in government-sponsored programs.
4. To enable more faculty members to engage in classified research in response to any national emergency.

There are other ways that MIT has contributed and will continue to contribute to public service that do not require the conduct of classified research on campus. One such form of public service is to make MIT's expertise available in an advisory capacity for oversight and review of classified government programs. Classified programs can often degrade in quality over time if they are not subjected to rigorous scrutiny by qualified outside professionals.

We believe that MIT's participation in classified research and oversight activities can make a valuable contribution to such research and provide a service to the nation, as well as serve institutional and individual interests.And there is no question that allowing classified research to be carried out on-campus would increase the involvement of faculty and students in these activities. But what is the cost to the mission of MIT and its continuing ability to serve the public interest if such work were to be a part of on-campus research activities?

6

The Implications of Performing Classified Research on Campus

MIT is presently engaged in classified research at Lincoln Laboratory to advance important national interests, and stands ready to take on additional classified programs under appropriate arrangements. Lincoln Laboratory is an off-campus facility that provides the required control of access and facilities for the conduct of classified research and development. Should controlled facilities be established on our campus for similar purposes?

The classified research regime has well understood laws and regulations, which would require that a dual research and research management system be set up on-campus.

1. A partitioning of on-campus research into two categories would be required, which would result in:
    a. Severely reducing the accessibility of personnel engaged in classified research from involvement with the community at large, including peer interactions, student involvement, departmental and laboratory reviews, and promotion considerations.
    b. Inaccessibility by foreign visitors, faculty members, staff, students, and other uncleared personnel to classified research. This would inevitably create two separate classes of individuals on campus.
    c. Sequestered laboratories, information systems, and offices, reducing collegial interactions between faculty, students, and staff.
2. MIT would need to set up another management hierarchy for classified research, which in all likelihood would differ from the hierarchy currently in place. Department heads would need security clearances in order to oversee the quality of the work of students and faculty.
3. Even if students do not conduct classified research, there would exist an increased likelihood of classifying student thesis research in mid-stream, or upon completion, if carried out in an area where faculty are performing classified research. This would put student careers in jeopardy.
4. In many cases a pre-publication review is required for papers reporting unclassified research, because a co-author was doing classified research. This can significantly delay or impede publication.

In the end, we believe that the restrictions of the free flow of research results, as well as control of individual access, would negatively impact national security by hampering the progress of science in important areas of human health, economic growth, and in all of the other areas that science has brought benefits to our nation. We are moved by the obligation of public service to the nation.

However, we believe that this is best met through an open and shared research environment on campus coupled with the operation of special facilities for classified research and the expansion of opportunities for faculty to engage in public service in significant ways. In their examination of current threats to national security, the Hart Rudman Commission concluded, "The inadequacies of our systems of research and education pose a greater threat to US national security than any potential conventional war we might imagine" (The United States Commission on National Security/21st Century, *Road Map for National Security* [Washington, D.C: USCNS, 2001]).

We also considered the question of whether MIT should provide a facility on-campus for classified material needed by the faculty for research or public service activities. We were persuaded, partly by recent government policy decisions and practices with regard to security, that the MIT campus should remain without such a facility. We believe that it is important for MIT to be able to state unequivocally that we do not store classified documents on our campus. MIT faculty who require such access can make other convenient arrangements at Draper Laboratory and Lincoln Laboratory or at other appropriate facilities, perhaps with the assistance of the sponsoring agency. MIT should facilitate such arrangements.

7

MIT's Involvement in Classified Research: The Role of Lincoln Laboratory and Other Off-Campus Laboratories

7.1 FACULTY INVOLVEMENT IN CLASSIFIED RESEARCH

We anticipate that research programs designed to respond to national needs may occasionally involve a classified component. Examples might include conducting a classified follow-on program to apply the results of fundamental research to the development of systems and/or hardware, or the need to use specialized equipment in cleared facilities to measure material or component characteristics. Often such research needs can be anticipated at the time the program is established; others may arise in mid-stream.

Such occurrences raise several issues that we believe can be dealt with within the current framework of MIT policy. The first is the need to keep department heads notified about the research activities that may for a time remove faculty members from active contact with students. The second is the need to insure that the Provost is informed about activities that involve MIT in complex relationships with other organizations. Without such notification, it is likely that administrators will be unaware of relationships that can affect MIT research in significant ways. We believe that such notification should be given at the initiation of a project, not just in the annual reports submitted by the faculty.

There exist several organizations that could enable MIT faculty to carry out the classified portions of their research. The most prominent of these is MIT's Lincoln Laboratory, but other organizations could also provide access to classified facilities. However, given its status as an MIT laboratory, Lincoln is a primary focus for such activities.

7.2 STUDENT INVOLVEMENT IN CLASSIFIED RESEARCH

Students at MIT carry out an essential component of the research program. MIT students come from a wide variety of backgrounds. Some students come from industry, government or the military with current security clearances. Depending upon their interests, background, and opportunities, they may become involved in research at Lincoln Laboratory or other defense-related organizations. Some Lincoln personnel may make a transition to graduate student status for a time, while some MIT students may take summer or part time employment in organizations that perform classified research.

However, these professional activities are distinct from their involvement as students in MIT's program of education, including thesis research. We affirm MIT's current policy that does not permit classified theses. Moreover, we believe that no student should require a security clearance nor require or have access to classified material to perform thesis research. All thesis defenses should be open to the MIT community.

We are concerned that students performing unclassified research in areas related to classified programs may be subject to pre-publication review of theses. If this becomes more than a prompt review, a procedure analogous to the delay provided to corporate sponsors for a similar review, then the area of research should be considered off limits for students. Similarly, if such a review results in a thesis or any part of it being classified, then the research area should be deemed unsuitable for future thesis research.

Faculty carrying out portions of their research in the classified domain, as discussed in section 7.1, should be especially sensitive to the need to preserve the openness of thesis research.

7.3 THE ROLE OF LINCOLN LABORATORY

Lincoln's central role is to conduct defense-related research and development activities. Consequently, a fundamental tenet of Lincoln's operation is the ability to do classified work. Lincoln Laboratory grew out of our defense efforts during WWII and in the post-war years. Lincoln, which this year is celebrating its fiftieth anniversary, has provided extraordinary service to the nation in furthering the development of several technical fields important to national security: sensors, information extraction, communications and other related technologies. Several MIT faculty members and students currently participate in this research. Lincoln Laboratory carries out both classified and unclassified research.

Lincoln is currently the only MIT facility where classified research is performed and could provide the facilities needed by MIT faculty to perform the classified elements of their research. When the research subject is of mutual interest to the campus and to Lincoln Laboratory, it is easy to make the decision to locate the research at Lincoln. But, even if there were no direct interest on the part of Lincoln Laboratory, it would be beneficial for the campus/Lincoln relationship if one can argue the research could be incorporated within the sphere of Lincoln's responsibilities.

In addition to the possibility that MIT faculty could carry out the classified portion of their research at Lincoln Laboratory, there is also the opportunity for MIT faculty and students to be involved in on-going Lincoln Laboratory research programs, both classified and unclassified, both on campus and at Lincoln. With respect to increased involvement of MIT faculty in Lincoln research programs there exist several issues.

Lincoln Laboratory's contract with its sponsor requires that any information, classified or unclassified, not be released for public dissemination unless approved for public release by appropriate United States government authority. This policy should be reassessed with respect to its application to on-campus collaboration between MIT faculty members and Lincoln staff. Collaboration with Lincoln personnel could also subject a faculty member's publications to prior review by DOD even if a Lincoln program does not fund the faculty member's work. DOD review prior to publication of on-campus research is inconsistent with our recommendations.

We urge the faculty committee that is charged with identifying opportunities for improvement of Lincoln's interaction with MIT faculty to address these issues. Use of MIT faculty in both classified and non-classified summer studies and scientific advisory committees would be a mechanism to introduce faculty to the challenges of Lincoln's research program. Possibilities could be explored with the sponsor to create a fundamental research fund that would provide a mechanism for collaborative on-campus research between MIT faculty and Lincoln staff that did not carry the pre-publication restrictions that are inherent in Lincoln's master contract. However, increased involvements that would carry research restrictions with them to the MIT campus are inconsistent with our recommendations.

Management and oversight of Lincoln Laboratory are major components of the public service that MIT carries out for the nation. In its oversight role, MIT should continue its active management of Lincoln Laboratory to insure that: the research meets MIT standards for independence and quality, and in so far as possible, Lincoln provides an environment that enables faculty to do research directed towards national service.

7.4 RELATIONSHIP WITH OTHER INSTITUTIONS

Despite its independence as a separate laboratory since its divestiture, Draper Laboratory has maintained a close relationship with MIT. Draper is located near the MIT campus. The facility maintains a dual classification structure. Small secured areas are maintained for classified projects and materials, but most of the research and physical facilities are unclassified. Several faculty members utilize Draper to access classified documents required for their research or public service activities. The Laboratory generally supports some fifty to sixty Draper Fellows (MIT graduate students co-supervised by MIT Faculty and MIT-appointed Draper personnel) and awards about two million dollars a year to universities for research with about 85% going to MIT.

The national security implications of the biological sciences are growing. It is not too hard to imagine a future Lincoln Laboratory-like entity conducting classified biologically related research in the Boston area. Just what role MIT might play in such an enterprise is not clear, but we would expect it to raise the same questions about campus-based research that were raised during WWII and the Cold War. We believe, however, that the framework we have suggested is equally applicable to this development.

The Whitehead Institute for Biomedical Research and MIT are separate institutions with strong cooperative programs in the biological sciences. Whitehead will also be affected by the issues we have discussed, and will be examining similar issues of restrictions on scientific research. MIT's statement of values and principles and the policies that flow from them could be of value to Whitehead as well as to other institutions wrestling with these issues.

8

On Campus Research Involving Select Agents

As discussed in section 3.4, the recently enacted USA Patriot Act defines restricted persons and prohibits their possessing, shipping, or transporting a number of select biological agents. At present, very few laboratories at MIT are affected by these regulations. However, the Secretary of H&HS has been given special powers to expand the list of select agents and is likely to add agents to this list if pending bills are enacted.

Although we have no concern with the health and safety aspects of these regulations, the requirements involving personnel, students, faculty, and staff are not consistent with MIT's principles. While we are currently fulfilling our obligations under this act, we should also reassess our involvement in research that requires such restrictions on personnel. It is likely that in the current climate, the number of agents on the list will grow and the restrictions placed on personnel, physical access, and publication of research findings may grow as well. At some point, MIT may rightfully decide that on-campus research in areas governed by these regulations is no longer in its interest or in line with its principles. We should consider applying a sunset clause to the acceptance of new contracts for research carried out under such restrictions, and the standing faculty committee should reexamine our policies and practices in areas affected by these regulations in the near future.

9

Industry-Sponsored Research: Challenges, Principles, and Concerns

MIT has had a long and fruitful involvement in industry-sponsored research, which actually pre-dates its involvement in government-sponsored research. Funding from industry benefits our faculty and students by supporting research and education. At the same time, these activities provide a service to the nation by insuring the flow of important technologies into the private sector. Nonetheless, we are concerned about the continuing pressures affecting the openness of industry-sponsored research results and their publication. We are also concerned that restrictions on openness may undercut the fundamental research exemption in the export control regime.

There are many interests involved in carrying out industry-sponsored research. The commercially driven motivations of an industry sponsor may often clash with institutional values, although in many cases, the values are aligned because of the mutual incentive of financial opportunity, and significant scientific and technological advance. MIT has policies in place governing the arms-length nature of the contractual requirements to insure that the loyalty and responsibility of the faculty is to MIT and its educational mission. Review of faculty off-campus relationships and restrictions on the hiring of students in faculty-related companies insure that both faculty and students have no conflict of interest regarding their responsibility to conduct research and disseminate its results. For the most part we are not concerned with these issues here.

Our concern is the openness of industry-sponsored research on campus, and specifically, how do our policies for dealing with this research, as agreed upon in research contracts and as practiced, comply with the values of the academic community?

Industry-sponsored research arrangements often contain some restrictions on the free flow of information from scientific research. These restrictions generally take the form of short-term limitations on the time of release and/or the content. There is no question that these restrictions affect the research environment and the educational process at MIT. The issue is whether or not the restrictions seriously interfere with the environment of openness at MIT.

The primary area of potential conflict is patents. Patent law in the United States requires that no published disclosure of patentable material be made more than one year before the patent application has been filed. Patenting requirements in most of the rest of the world are more stringent and preclude virtually all forms of public disclosure prior to filing. Thus, although students are free to present and discuss their potentially-patentable results in their research groups, if foreign patent coverage is desired, no public presentation outside of MIT would be allowed prior to the filing of a patent. These limitations include presentations at scientific meetings, public seminars at MIT and other universities, and of course journal publication. In some cases, a student's thesis presentation might have to be closed to

members of the MIT community and even to the full department faculty, resulting in an undesirable effect on the educational process. These prohibitions might have a significant effect on the early career development of a graduate student. In most cases, publication delays to allow the sponsor to examine the work for possible patents are limited to no longer than sixty to ninety days.

Another area in which there is some effect on the MIT research environment has to do with proprietary or confidential information that is received from a research sponsor. In order to maintain an open research environment, MIT's agreements with industry strictly limit the amount of confidential information accepted by a principal investigator to what is necessary to conduct the research program. Under no circumstances will MIT engage in a research program that requires a student to handle company-confidential information, in order to participate in the research program.

MIT has guidelines for governing company-sponsored research. The governing principles are: that MIT will maintain free exchange of research ideas among its faculty and students and their peers at other institutions; that it will not put the thesis research of its students in jeopardy of not being released for publication; that there should be no conflict of interest existing between MIT researchers and those companies in which faculty have significant financial interests or for which they consult; and that MIT will not engage in proprietary or confidential research for any industrial company (or government sponsor). The guidelines established to ensure that MIT's core mission of education and research are not compromised by performing industrial research are summarized as follows.

1. Companies cannot require a right of approval over the content of published research results.
2. Company sponsors are granted a right to acquire a royalty free non-exclusive license of the research they sponsor—subject to a de minimus annual payment. Companies are also granted an option to acquire an exclusive, royalty-bearing license on terms and conditions to be negotiated, generally after the invention is made.
3. Company sponsors cannot claim reach-back rights to pre-existing MIT intellectual property.
4. Company sponsors have a period of from thirty to sixty days to examine publications, including theses, for material appropriate for patent filing, or for an inadvertent release of the company's confidential information. If determined to be patentable, the company has thirty to sixty more days during which time they can request MIT to file patent applications. The application process must be completed before publications, including theses, are made available to the public. Company sponsors are given a total of ninety days to complete these review processes.
5. Companies cannot alter the result of the MIT research and cannot apply additional release restrictions on its published dissemination beyond the negotiated period of no longer than ninety days for patent filing. An additional thirty day delay may be granted by MIT.
6. If MIT faculty and students consult for a company that is sponsoring their research, this fact must be disclosed prior to accepting the research contract and the conflict of interest must be evaluated.
7. Faculty may not hire their students or postdoctoral fellows to work for companies in which the faculty member has a financial interest if the area of work is related to the research areas in which the postdoctoral fellow or student is working.

8 MIT will not accept research projects where students must have access to company-confidential information in order to participate. MIT will not permit or require students to sign individual non-disclosure agreements as part of a research program.

9 MIT does not accept research programs that require the assignment of title to intellectual property developed by MIT faculty, students, or staff to the sponsor.

10 Company sponsors are restricted from using promised MIT involvement and possible research achievements for the explicit purpose of raising operating funds.

11 Research facilities on campus supported with company funds should not carry restrictions on access by other investigators or establish significant preferential access by faculty, students, staff, or visitors funded or sent in by the company sponsors.

Our committee has not been able to address all of the issues raised by industry-sponsored research. We therefore recommend that one of the first agenda items for the standing faculty committee we have recommended should be a review of MIT policies in this area as well as their application in practice. We also believe that this committee should monitor any apparent restrictions on openness and access that violate MIT's principles that come to its attention arising from implicit arrangements made with sponsors.

10

Findings and Recommendations

1 **CLASSIFIED RESEARCH ON THE MIT CAMPUS:** MIT remains committed to a strong role of public service and, as appropriate, to expanding the scope of that service. Such an expansion can include facilitating faculty members to serve the nation's national security needs within the framework laid out in our report. However, after examining the implications of conducting classified research on campus, we conclude that retaining an open research environment with free flow of research results and information on the MIT campus is the best way for MIT to fulfill its public service responsibility.

Therefore, we recommend that no classified research should be carried out on campus, that no student, graduate or undergraduate, should be required to have a security clearance to perform thesis research, and that no thesis research should be carried out in areas requiring access to classified materials.

2 **STANDING FACULTY COMMITTEE TO MONITOR DEVELOPING RESTRICTIONS ON ACCESS TO AND DISCLOSURE OF SCIENTIFIC INFORMATION:** Currently, the Faculty Policy Committee has responsibility to consult with the Provost regarding exceptions to MIT policy regarding the conduct of research. We believe that the current situation requires more intensive attention than that committee can provide. Therefore, we recommend that a new standing faculty committee be established to monitor the evolving Federal legislation and MIT's response to these issues, as well as any exceptions granted to MIT policy for restrictions on access to and disclosure of research results, for both industry- or government-sponsored research. We also believe that this committee should monitor any issue of openness that comes to its attention arising from implicit arrangements made with sponsors that violate MIT's principles and go beyond contractual language.

3 **SENSITIVE AND OTHER RESTRICTIVE DESIGNATIONS:** Because there is no consistent understanding or definition of what would constitute "sensitive" information, MIT should continue its policy of not agreeing to any sponsor's contractual request that research results generated during the course of a program be reviewed for the inadvertent disclosure of "sensitive" information. Beyond this, MIT should not accept or hold any documents on its campus that are designated "sensitive" or "no foreign nationals," nor restrict any students from access to any course, on-campus seminar, or other similar forum. MIT should not designate any on-campus facilities as requiring special conditions for access beyond that required by existing legislation.

4 **SELECT AGENTS:** The recently enacted USA Patriot Act defines restricted persons and prohibits their possessing, shipping or transporting a number of select biological agents. At present, very few laboratories at MIT are affected by these regulations. However, the Secretary of Health and Human Services (H&HS) has been given special powers to expand the list of select agents and is likely to add agents to this list if pending bills are enacted.

The requirements involving personnel, students, faculty, and staff are not consistent with MIT's principles. It is likely that in the current climate, the number of agents on the list will grow and the restrictions placed on personnel, physical access, and publication of research findings may grow as well. At some point, MIT may rightfully decide that on-campus research in areas governed by these regulations is no longer in its interest or in line with its principles. We should consider applying a sunset clause to the acceptance of new contracts for research carried out under such restrictions, and the standing faculty committee should in the near future, reexamine our policies and practices in areas affected by these regulations.

5 **EXPORT CONTROLS:** MIT and its faculty are affected by laws governing export of scientific information and artifacts. Since most fundamental research enjoys an exemption from the need to seek export licenses prior to disseminating information or items, open communication in all of its aspects is the best means to insure that research results can be freely communicated. MIT should insure that the designation of fundamental research and public domain extends to as much of its ongoing research activity as possible, consistent with the national interest. Any formal or contractual restrictions on the open sharing of research results eliminate a project's fundamental research and public domain exemptions. Such restrictions should be accepted only after careful analysis of their effects upon MIT and its research program. The administration of MIT should insure that faculty members understand their obligations under these export control laws.

6 **FACULTY PARTICIPATION IN CLASSIFIED RESEARCH:** Issues arising from the participation of faculty members in off-campus classified research as an extension of on-campus research can be handled within the current framework of MIT policy. First, faculty members need to keep department heads notified about the extent of a research activity that may for a time remove the faculty member from active contact with students. Second, the Provost must be informed about activities that involve MIT in complex relationships with other organizations. Without such notification, it is likely that administrators will be unaware of the relationships that can significantly affect MIT research. We believe that such notification should be given at the initiation of a project, not just in the annual report from faculty.

There exist several organizations that can provide access to classified facilities to enable MIT faculty to carry out the classified portions of their research. The most prominent of these is MIT's Lincoln Laboratory, but several other organizations could also provide such access.

7 **LINCOLN LABORATORY:** The management and oversight of Lincoln Laboratory are major components of the public service that MIT carries out for the nation. In its oversight role, MIT should continue its active management of Lincoln Laboratory to insure that: the research meets MIT standards for independence and quality, and in so far as possible, Lincoln provides an environment that enables faculty to do research with national security implications.

8 **RELATIONS WITH OTHER LABORATORIES:** MIT and its faculty have ongoing relations with a number of independent defense-supported research laboratories such as Draper Laboratory, Air Force Research Laboratory, Natick Army Laboratory, and the Naval Undersea Warfare Center in Newport, R.I.. These facilities offer opportunities to strengthen our activities in research that have applications to national security. In particular, MIT should strengthen its relationship with Draper Laboratory and have access to Draper as an off-site facility for research and administrative support for faculty requiring access to classified material.

9 **EXTRAORDINARY EVENTS:** There may be times when rapid near-term access to specialized MIT on-campus facilities and expertise will be required by the nation. Examples of this would be the need for forensic analysis of biological materials, materials preparation, and the use of other facilities and expertise for significant national purpose other than research. Providing this type of assistance may require special procedures for restricted access. We believe that MIT should make such expertise available for a short-time response with a time-definite sunset clause. An MIT response to such emergencies would require the permission of the Provost in consultation with the standing faculty committee we have recommended.

10 **INDUSTRY-SPONSORED RESEARCH:** Our committee has not been able to address all of the issues raised by industry-sponsored research.We therefore recommend that the standing faculty committee we have suggested review MIT policies in this area, as well as their specific application in practice, as one of its first agenda items. We are concerned about growing pressures affecting the openness of research results and their publication that arise from involvement in industry-sponsored research. We are also concerned that restrictions on openness may undercut the fundamental research exemption in the export control regime.

11 **RESEARCH CONDUCT:** MIT should incorporate in *Policies and Procedures* explicit statements about acceptable research behavior and clear standards for the conduct of research to insure that implicit agreements are not reached with research sponsors that violate MIT's policies on openness and access. Such guidelines should be incorporated into the material that accompanies the annual report that faculty make, detailing their outside professional activities and their on-campus research relationships.

12 **FACULTY ACCESS TO CLASSIFIED RESEARCH AND MATERIALS:** MIT faculty play important public service roles in areas requiring access to classified materials.To support these activities we recommend that MIT hold security clearances for faculty who require them, and provide off-campus facilities to allow access to classified materials needed to engage in research or public service.

We do not recommend that MIT provide facilities for storage and access of classified materials on the MIT campus. An off-campus site should be provided for faculty to use such material, as required, utilizing the facilities of Lincoln or Draper Laboratories.

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appendix B

Current and Past MIT Policies Governing Openness of Research

The current MIT policies governing the openness of research are contained in *Policies and Procedures* 14.2 (included below). These policies have evolved since they were first addressed in the 1945 edition of *Policies and Procedures*. A brief history of the development of these policies is contained in this Appendix.

CURRENT POLICY

14.2 Open Research and Free Interchange of Information
MIT Policies and Procedures, 9/97

The encouragement of research and inquiry into intellectual areas of great promise is one of the most basic obligations MIT has to its faculty, to its students, and to society at large. The profound merits of a policy of open research and free interchange of information among scholars is essential to MIT's institutional responsibility and to the interests of the nation as a whole. Openness requires that as a general policy MIT not undertake, on the campus, classified research or research whose results may not be published without prior permission—for example, without permission of governmental or industrial research sponsors. Openness also requires that, once they are at MIT, foreign faculty, students, and scholars not be singled out for restriction in their access to MIT's educational and research activities.

The vast majority of on-campus research projects can be conducted in a manner fully consistent with the principles of freedom of inquiry and open exchange of knowledge. MIT, however, is an institution that plays a unique role in important areas of science and technology that are of great concern to the nation. It recognizes that in a very few cases the pursuit of knowledge may involve critically important but sensitive areas of technology where the immediate distribution of research results would not be in the best interests of society. In such cases, exceptions to these policies regarding publication, classification, and access by foreign students and scholars may be made, but only in those very rare instances where the area of work is crucially important to MIT's educational mission and the exception is demonstrably necessary for the national good. If these conditions are not met, MIT will decline or discontinue the activity and, if appropriate, propose it for consideration off-campus or elsewhere. Since the implementation of classified or otherwise restricted research on campus would drastically change the academic environment of the Institute, it is essential that each project be reviewed and acted upon in light of its impact on the Institute as a whole.

> It is the policy of the Institute, therefore, that every research project within the academic structure of MIT (excluding Lincoln Laboratory) that requires a classification on the research process, classification as to the source of funds, classification of the research results, or imposition of other restrictions on publication or access must receive the prior approval of the Provost, who shall seek the advice of the Faculty Policy Committee and will inform the committee of all approvals. When unrestricted research at MIT is important to the national security, appropriate efforts will be made to ensure that relevant government agencies are informed of the results at the same time, as are others in the scholarly community.
>
> Theses, whether undertaken by graduate or undergraduate students, are an integral part of the research program of the Institute and fall within the statement of policy concerning classified or otherwise restricted research on campus as stated above. No thesis requiring that a student have a clearance or requiring a security review upon its completion may be embarked upon without the prior approval of the Provost. When graduate theses are involved, the Provost shall seek the advice of the Committee on Graduate School Policy in cases that involve modification of existing policy and will inform the committee of all approvals.

POLICIES: 1940'S – 1960'S

MIT's *Policies and Procedures* was issued for the first time in 1938, and while that first manual affirms the Institute's responsibility to serve the government and society as a whole, there is no statement about classified research. (*Policies and Procedures* has not been published each year, but reissued as needed. Relevant policies from all of the known editions are included below.)

During World War II policies on classified research evolved and were published in the **1945 edition** of ***Policies and Procedures***:

> MIT has always felt a special responsibility to render public service, especially to any branch of local, state or federal government. This policy will continue.
>
> Only under conditions of great emergency will projects be accepted which do not contribute to the advancement of educational objectives or of scientific knowledge or of engineering art.
>
> Imposition of restrictions on publication results, either for secrecy or patent reasons, might be incompatible with the basic concept of an educational institution as a source and distributor of knowledge. Research contracts involving such restrictions, especially long-term or permanent restrictions, should be undertaken only for exceptional and important reasons. In no case should a situation be permitted which could inhibit free and effective work by MIT in any scholarly field.

The **1952 edition** of ***Policies and Procedures*** reaffirms the Institute's "special obligation to render service to the Commonwealth, to the cities of Cambridge and Boston, and to the several agencies of the Federal Government." The policy on classified was restated:

> Contracts calling for classified research should be accepted only in time of national emergency and continued only if there are compelling reasons for so doing. During a national emergency of long duration, restrictive contracts of this type will be accepted only if the work is of great

> importance to the national welfare or defense, if it cannot be done more effectively elsewhere, and only if it can be done without undue curtailment of the program of instruction and fundamental research, the carrying out of which is the Institute's long range responsibility to the nation.

The **1961 edition** records further changes:

> Contracts calling for classified research are contrary to one of the basic objectives of any educational institution—namely the dissemination of knowledge. Nevertheless, for the past several years there has been a great need for classification of research results in some areas, and there are compelling reasons for the Institute to enter into contracts for work in these areas. This need is expected to continue for some time. Restrictive contracts of this type, however, should be accepted only if the work is of great importance to the national welfare and only if it can be done without undue curtailment of the program of instruction and fundamental unclassified research, the carrying out of which is the Institute's long-range responsibility to the nation.

Finally, the **1966 version** stated:

> Restrictions on the publication of research results, for the reasons relating either to secrecy or to patents, are contrary to one of the basic objectives of an educational institution, namely the dissemination of knowledge. Accordingly, it is the policy of the Institute, apart from the programs of the Instrumentation and Lincoln Laboratories, to undertake research contracts with security provisions only in the most exceptional circumstances. In all such exceptional cases, moreover, it should be clearly demonstrated that the work is of fundamental importance and that access to restricted information is essential to progress in the field. Exceptions will be approved only after careful consideration and review of all of the pertinent facts, and only if the work is otherwise compatible with the Institute's general program of unclassified research and teaching.

POLICY CHANGES – 1970 TO THE PRESENT

The Final Report of the Review Panel on Special Laboratories did not address where classified research should be allowed, but did recommend a reduction in classified research and clearance barriers.

> The Panel recognizes that classified work may have to be continued at the laboratories, but recommends reducing the present amount of classified research to a minimum, both by selection of projects and by pressing for declassification wherever possible. In particular, classification of project descriptions must be severely limited or removed entirely, since this practice prevents the MIT community as a whole from knowing even the nature of some MIT activities.
>
> Changes are also required in the physical arrangements to make it easy for uncleared students and faculty to participate in the unclassified parts of the laboratories' program. These steps are essential to achieve the desired increase in campus interaction and must be pursued, even at the cost of administrative inconvenience.

These recommendations were reflected in the statement on classified research included in Section 4.11b of the next edition of ***Policies and Procedures***, published in **1975**.

> MIT affirms that the encouragement of research and inquiry into intellectual areas of great promise is one of the most basic obligations to its faculty, to its students, and to society at large. It affirms the profound merits of a policy of open research and free interchange of information among scholars as essential to that responsibility.
>
> In the vast majority of research projects, the encouragement of inquiry wherever the research might lead is not in conflict with the principle of freedom of inquiry and open exchange of knowledge. However, MIT is an institution that plays a unique role in important areas of science and technology that are of great concern to the nation. It recognizes that in a very few cases the pursuit of knowledge may require access to data or literature of a classified nature, or yield results whose immediate distribution would not be in the best interests of society. It affirms, therefore, that such activities are undertaken only when, after weighing the advantages and disadvantages for the academic program and for the nation, they are judged to be highly constructive. Since the implementation of classified research has some aspects that are detrimental to the academic environment of the Institute, it is essential that each project be reviewed and acted upon in the light of its impact on the Institute as a whole.
>
> It is the policy of the Institute, therefore, that every research project within the academic structure of MIT (excluding Lincoln Laboratory) which requires a classification on the research process or on the publication of results receive the prior approval of the Provost, who shall seek the advice of the Committee on Educational Policy in cases that involve modification of the existing policy and will inform the Committee of all approvals.
>
> Theses, whether undertaken by graduate or undergraduate students, are an integral part of the research program of the Institute and fall within the statement of policy concerning classified or otherwise restricted research on campus as stated above. No thesis may be embarked upon which requires security clearance or for which there is a requirement for security review upon its completion without the prior approval of the Provost, who shall seek the advice of the Committee on Graduate School Policy in cases that involve modification of existing policy and will inform the committee of all approvals.

The 1975 version of this policy remains fundamentally in place today. The Faculty Policy Committee is now designated as the group the Provost must consult about exceptions, and this policy is now section 14.2 of *Policies and Procedures*, entitled, "Open Research and Free Interchange of Information."

A few substantive changes have been made. From **1985** on, ***Policies and Procedures*** reflected the distinction between on-campus and off-campus research, and in 1990 an additional statement was added about the value of openness:

> Openness requires that as a general policy MIT not undertake, on the campus, classified research or research whose results may not be published without prior permission—for example, without permission of governmental or industrial research sponsors. Openness also requires that, once they are at MIT, foreign faculty, students, and scholars not be singled out for restriction in their access to MIT's educational and research activities.

In **1990** the following statement was also added about exceptions, and when MIT will decline such work:

> …exceptions to these policies regarding publication, classification, and access by foreign students and scholars may be made, but only in those very rare instances where the area of work is crucially important to MIT's educational mission and the exception is demonstrably necessary for the national good. If these conditions are not met, MIT will decline or discontinue the activity and, if appropriate, propose it for consideration off-campus or elsewhere. Since the implementation of classified or otherwise restricted research on campus would drastically change the academic environment of the Institute, it is essential that each project be reviewed.

appendix C

Reference Guide to the Management of Restrticted Scientific Information

	CLASSIFIED	SENSITIVE	EXPORT / EMBARGO CONTROLLED	PROPRIETARY **A Third party owned** **B MIT generated**	SELECT AGENTS
Definition	National security information at the levels of Top Secret, Secret and Confidential.	There is no formal definition. Sensitive is as defined by the contracting officer.	Export control laws (EAR and ITAR) control disclosure in any medium of items (hardware, equipment), software, and information (training, meetings), imposing conditions (including licensing) on providing items, software or information to foreign nationals in the U.S. or abroad, or U.S. citizens abroad. Embargoes separately impose prohibitions and restrictions on transactions with, exports of items and software to, and travel to embargoed countries.	**A** Defined in the document governing its transfer to the Institute. Must be (i) proprietary to the owner; (ii) identified as proprietary when transferred; and (iii) not released to the public; not already known to MIT; not received by MIT from others without obligations, not independently developed; and not released with the owner's permission. **B** Invention disclosures or information that may be patentable. MIT does not keep research results confidential.	USA Patriot Act (http//:web.mit.edu/enviroment/programs/patriot.html) prohibits "restricted persons" (defined in Section 817(2)) from shipping, transporting or transferring, possessing and/or receiving "select agents" (listed and not exempted in 42 CFR 72, whether or not subject to 1996 Act registration). The Act (Section 817(1)) also prohibits anyone from possessing biological agents or "delivery systems" in quantities or types not reasonably justified by "bona fide research or peaceful purposes". The 1996 Anti-terrorism and Effective Death Penalty Act ("1996 Act") requires institutions (facilities) to register with the CDC prior to receiving or transferring listed non-exempt select agents (42 CFR 72).
Governing Rules and Responsibilities	The National Industrial Security Program Operating Manual (NISPOM) pursuant to Executive Order 12829 is the governing document	Sensitive but unclassified research results cannot be released without approval of a contracting officer.	The Export Administration Export Administration Regulations (EAR) administered by the Department of Commerce, 15 CFR 730-774; International Traffic in Arms Regulations (ITAR) administered by the Department of State, 22 CFR 120-130; OFAC Embargo Regulations, administered by the Treasury Department, 31 CFR 500-598.	**A** *Policies and Procedures* 13.2.5 Acquisition and Use of Third-Party Products and Services: For MIT-generated research, an expectation that invention disclosures and patent applications will be confidential until a patent application is filed. Confidentiality practices protect patentability and not trade secrets.	Section 817 (1) and (2) of the Patriot Act (Oct., 2001) amending the federal criminal code, Chapter 10, Title 18 of the U.S. Code. The 1996 Anti-terrorism and Effective Death Penalty Act ("1996 Act") and its regulations, 42 CFR 72. Covered agents cannot be received or transferred from one facility to another (within or outside MIT) without approval of the Bio-safety program deputy director.

	CLASSIFIED	SENSITIVE	EXPORT / EMBARGO CONTROLLED	PROPRIETARY **A Third party owned** **B MIT generated**	SELECT AGENTS
Policies and Practices Related to: ***MIT***	MIT's Security Manual of Standard Practices and Procedures implementation of the NISPOM.	Nothing specific. The Institute will not accept restrictions on publications.	MIT accepts research projects that may require export licenses for certain technologies. MIT does not accept restrictions on publications or assignment of students to individual research projects.	**A** Non-disclosure agreements reviewed by IP Counsel or OSP and signed in OSP. Also under Attachment B to MIT's standard Research Agreement. Also from vendors licensing software to MIT. And some biomaterials under non-disclosure	Currently the Patriot Act prohibitions apply to individuals, not institutions. The regulatory registration requirements of the 1996 Act apply to the facility receiving or transferring covered agents
Faculty	Cleared individuals are personally responsible for safeguarding classified information	Not applicable	The EAR and ITAR regulations control the dissemination of information, software, and items to overseas locations or consignees or, in certain circumstances, to foreign nationals in the U.S. ("deemed export") or abroad. Further, the OFAC regulations restrict/prohibit (and may require licenses for) travel to or export of certain software and items to embargoed countries. Prohibitions, licensing, and civil and criminal penalties for violations apply to the individual (whether faculty, students or staff) and the institution.	**A** Obligated under confidentiality agreements signed by MIT. Faculty cannot bind the Institute to confidentiality. Faculty cannot sign personal NDAs for Institute research programs. Confidential information cannot be released to students, staff or other faculty under personal non-disclosure agreements. Individual faculty members can enter into "pre-proposal" NDAs with industry that bind only the faculty member. These agreements are superseded by a standard OSP research agreement (with Proprietary Information Attachment) if the company decides to fund research. **B** There are no confidentiality obligations imposed upon the faculty beyond obligations limiting publication to protect patentability. MIT does not impose secrecy or confidentiality restrictions on faculty. Limitations are placed only on publication prior to TLO or sponsor review for patentability. The faculty are expected to honor contractual obligations of sponsor review prior to publication. Faculty obligations do not extend to non-disclosure.	Prohibitions and criminal penalties under the Patriot Act apply to individuals who are "restricted persons", whether faculty, students, or staff. Currently, "restricted persons" may continue to work in laboratories having listed non-exempt select agents, but must not work with, handle, or have anything (even paperwork) to do with possessing, receiving, shipping or transporting such agents (whether or not the lab is registered with CDC). Individuals who work with select agents must receive appropriate training with regard to safety and security protocols (whether under MIT policy or under the 1996 Act).

	CLASSIFIED	SENSITIVE	EXPORT / EMBARGO CONTROLLED	PROPRIETARY **A Third party owned** **B MIT**	SELECT AGENTS
Policies and Practices Related to: ***Students***	Cleared individuals	Not applicable	Same as above	**A** Obligated under agreements signed by MIT if they wish access to confidential information. Students are not required to sign personal agreements in order to get access. MIT will require only an acknowledgement form (used sparingly). Student-signed confidentiality agreements are not binding on the Institute. **B** MIT imposes no non-disclosure obligations upon students with regard to their research.	Same as above
Publications	Cleared individuals	Not applicable	Publication restrictions destroy the "fundamental research exclusion" allowed in the regulations (which, in any event, applies only to exports to foreign nationals in the U.S.). MIT does not accept restrictions on publications other than a limited delay for patent protection or to allow a sponsor to remove its proprietary information	**A** Third-party owned confidential information that is accepted by an authorized signatory for the Institute cannot be published during the term of confidentiality without permission of its owner. Many non-disclosure agreements have sunset provisions for term of confidentiality. MIT's preference is 3-5 years but sometimes accepts a perpetual term, as i.e. source code. **B** Publication of research is permitted at any time, subject to federal regulatory and research sponsor requirements to (i) balance publication with preservation of patent rights in the case of federally funded research programs and (ii) to provide the sponsor with a period of publication review (30-60 days) for identification of patentable material and for removal of a sponsor's inadventently included proprietary information if required under a sponsored research agreement.	Not applicable

	CLASSIFIED	SENSITIVE	EXPORT / EMBARGO CONTROLLED	PROPRIETARY **A Third party owned** **B MIT**	SELECT AGENTS
Documents	There are no classified documents on campus	Not applicable	Same as above	**A** MIT must use reasonable efforts to avoid duplication and release outside of the Institute. MIT avoids accepting strict liability for proprietary information and does not guarantee against unauthorized disclosure. No standards for handling third-party owned confidential information. Responsibility lies with the principal investigator Software documentation and code follows above standard. Confidential information disclosed orally must be identified as confidential when disclosed and follow-up in writing within 20-30 days. **B** Invention disclosures are marked as confidential. Other research-generated documents such as reports should be (but are not always) marked as copyrighted to MIT.	MIT has developed an information sheet and self-assessment questionnaire [http://web.mit.edu/environment/ patriot.html] which notifies affected individuals of the Patriot Act prohibitions and asks them to confirm their understanding. The 1996 Act requires that MIT maintain transfer, receipt, and disposal documentation in connection with listed non-exempt select agents.
Objects and Devices	There are no classified objects or devices on campus	Not applicable	Certain items (e.g., equipment and hardware) may require licenses to be shipped overseas. The identity of such items appears either on the U.S. Munitions List (USML) of the State Department or the commodity control list (CCL) of the Commerce Department. The lists are available on line at http://pmdtc.org (ITAR) or http://www.bxa.doc/gov/ (EAR).	**A** MIT does not generally accept objects or devices that are considered proprietary in terms of external view or design. It does accept objects or devices that contain proprietary information inside the cover or black box. The same principles apply as to written proprietary information. **B** MIT has no policy covering, and does not impose confidentiality obligations on objects/devices created or developed at the Institute.	Section 817(1) of the Patriot Act imposes criminal penalties on anyone who "knowingly" possesses biological agents or toxins or "delivery systems" in quantities or of types not "reasonably justified" by a "bona fide research or other peaceful purpose". Does not apply to the 1996 Act.

	CLASSIFIED	SENSITIVE	EXPORT / EMBARGO CONTROLLED	PROPRIETARY **A Third party owned** **B MIT**	SELECT AGENTS
Operational Responsibility	The MIT Facility Security Officer is Anthony F. Favaloro, Assistant Director, Office of Sponsored Programs.	In terms of negotiating clauses, responsibility is with the Office of Sponsored Programs.	The responsible official for MIT in administering the ITAR, EAR and Treasury regulations is Julie T. Norris, Director of Sponsored Programs, who is also responsible for signing license applications for the State, Commerce and Treasury departments.	**A** The principal investigator wishing access to proprietary information or, the highest-ranking administrative officer in the unit desiring access. If needed only by one individual, that person is responsible. **B** MIT responsible officers for invention disclosures are both principal investigators and the TLO. MIT responsible officer(s) for publication review are the principal investigators.	Patriot Act: Jamie Lewis Keith, Senior Counsel; 1996 Act: Claudia Mickelson, Deputy Director, EHS Office (Biosafety Program).
Physical Facilities	One (1) Mosler safe capable of storing material to the level of Secret is on campus.	Not applicable	Not applicable	**A** Not applicable **B** Not applicable	Under the 1996 Act, facilities must be registered with CDC to receive or transfer listed non-exempt agents. To obtain registration, facilities must be equipped and capable of handling such agents (including locking laboratories, lock boxes for the agents, and locked refrigerators). MIT applies similar security to other very hazardous biological agents.