COMMENTS AND SUGGESTIONS FOR IMPLEMENTING THE FEDERAL TECHNOLOGY TRANSFER ACT OF 1986 (P.L. 99-502)

A compilation of suggestions developed informally by Federal employees interested in successful implementation of the Act. (References to "the Act" refer to this Act, and Stevenson-Wydler section numbers are shown as they will be after codification.)

A. STATUTORY PROVISIONS TO BE CONSIDERED IN COOPERATIVE R&D AGREEMENTS

1. STATUTORY PROVISION.

> 11(c) CONTRACT CONSIDERATIONS. -- (1) A Federal agency may issue regulations on suitable procedures for implementing the provisions of this section; however, implementation of this section shall not be delayed until issuance of such regulations.

COMMENT

Agency regulations could be drawn from several sources including:

- Provisions of subsection 11(c).
- Other provisions of the Stevenson-Wydler Act as amended.
- P.L. 96-517 and implementing regulations for licensing Government-owned inventions.
- P.L. 98-622 on Statutory Invention Registrations
- Executive Order 10096 on Government Employee Inventions.
- Other agency or laboratory authorities for collaboration and technology technology transfer.
- Government-wide conflict of interest rules, agency specific conflict of interest provisions, and agency interpretations.
- Existing agency delegations of authority and procedures for their revision.

SUGGESTIONS

It will probably be several years before the opportunities and problems in the Act are fully understood. It is too soon to try to develop extensive and detailed regulations. As a minimum, an agency could provide for review of proposed licenses and

cooperative R&D agreements in its delegations of authority and issue no regulations at all.

Above the minimum, an agency could indicate its intent to comply with the Act, offer guidelines for handling the most likely situations, and provide for case-by-case review of each license or cooperative R&D agreement. The level of the review could be a function of the size and complexity of the agreement. It may be wise to take this approach, covering only the most important points in an initial issuance.

The definition of "laboratory" is in the Act is flexible. Each agency may need to define term in its own context if used in delegations.

Because of the definition of cooperative R&D agreement, neither procurement policies in the Federal Acquisition Regulation nor assistance policies in OMB circulars apply to R&D agreements. Agencies should be sure that policies developed for arms-length relationships are not applied to the detriment of cooperative R&D agreements.

2. STATUTORY PROVISION

> (2) The agency in permitting a Federal laboratory to enter into agreements under this section shall be guided by the purposes of this Act.

COMMENT

The Act has no "purposes" section, but the preamble says it is:

> "To amend the Stevenson-Wydler Technology Innovation Act of 1980 to promote technology transfer by authorizing Government-operated laboratories to enter into cooperative research agreements and by establishing the Federal Laboratory Consortium for Technology Transfer within the National Bureau of Standards, and for other purposes."

SUGGESTION

The emphasis is on laboratories, not agencies. The intent is decentralization of authorities and decisions. Agencys' implementations should be consistent with this purpose.

3. STATUTORY PROVISION

> (3)(A) Any agency using the authority given it under subsection (a) shall review employee standards of conduct for resolving potential conflicts of interest to make sure they adequately establish guidelines for situations likely to arise through the use of this authority, including but

not limited to cases where present or former employees or their partners negotiate licenses or assignments of titles to inventions or negotiate cooperative research and development agreements with federal agencies (including the agency with which the employee involved is or was formerly employeed).

COMMENT

The Senate-House Conference Report on H.R. 3773 (the Act) contains the following statement:

> "It (the Act) also clearly gives permission to present and former federal employees of a laboratory to be a party to efforts to commercialize that laboratory's inventions, to the extent they can do so and not be in violation of agency requirements and standards of conduct."

S. 65, the precursor of this Act included the following section:

> "It shall be the policy of the Government to encourage the efforts of Government employees or former employees to obtain commercialization of inventions made by them while they were in the Service of the United States, and it shall not be a violation of the provisions of 18 U.S.C. 207 for former employees or the partners of employees to negotiate licenses or cooperative research and development arrangements relating to such inventions with Federal agencies, including the agency with which the employee is or was formerly employed. Federal employees or former employees who receive royalty payments or participate (whether as a principal of, a consultant to, or an employee of an organization that is attempting to commercialize the invention, or otherwise) in efforts to commercialize their inventions shall not, because of such receipt or participation, be deemed to be in violation of section 203, 205, 207, 208, or 209 of title 18 of the United States Code. In the case of an active employee of the Government, this section is not intended to negate any requirements which the agency may have concerning the need for approval of outside employment." (Emphasis added)

This provision had OMB and Justice approval in June of 1985. It was dropped from the bill by the Senate staff because it was thought to be unnecessary since the authorities in bill are specific and should take precedence over the general conflict of interest provisions of 18 U.S.C.

The example in the Act comes directly from the original bill, and can probably be taken as the type of activity that Congress intends. Four other indications of Congressional intent are:

- A similar provision was in S. 2171 as reported by the Senate Judiciary Committee on October 5, 1984. Senate Report 98-662 on S. 2171, which was a precurser of P.L. 99-502 says:

  "Traditional conflict of interest regulations, which were designed to protect both Federal employees and the public interest, need to be revised to allow direct participation of la;boratory employees in the commercialization of inventions in which they may have a personal interest. Personnel regulations must be developed that permit the effective use of the authorities contained in this Amendment..."

- Section 14 requires agencies to allow employees to own inventions the agency does not intend to patent and commercialize. Implicit in this provision is the assumption that employees will become involved in commercialization through a wide range of business relationships without being required to leave their Government employment.

- Section 10(a) now includes the following policy statements:

  - "Technology transfer, consistent with mission responsibilities, is a responsibility of each laboratory science and engineering professional."

  - "Each laboratory director shall ensure that efforts to transfer technology are considered positively in laboratory job descriptions, employee promotion policies, and evaluation of job performance of scientists and engineers in the laboratory."

- Subparagraph (3)(B) (discussed under item 4 below, calls on agencies to tell Congress what changes they need in their current statutory framework to resolve potential conflict of interest situations. Since both (3)(A) and (B) seem to refer to conflict of interest standards and statutes, one can reason that Congress intends for them to be adjusted to allow extensive interaction between lab employees (and former employees) and cooperating or licensing firms.

The relevant conflict of interest sections of 18 U.S.C. are:

- 203 -- Compensation to Members of Congress, officers, and others in matters affecting the Government.

- 205 -- Activities of officers and employees in claims against and other matters affecting the Government.

- 207 -- Disqualification of former officers and employees; disqualification of partners of current offficers and employees.

- 208 -- Acts affecting a personal financial interest.

- 209 -- Salary of Government officials and employees payable only by United States.

These sections are concerned with situations where the interests of the United States are likely conflict with those of others. Most include an "unless otherwise provided by law" caveat. They largely speak to individuals, not agencies. In general, they don't appear to be written for a situation where a Federal laboratory and a non-Federal party agree to cooperate on a mutually beneficial basis authorized by law, and a Federal employee or former employee may need interests in both for the cooperation to be effective. However, section 207 does provide for special treatement of former employees where the national interest is served by their transfer of scientific and technical information. In general, it may be found that:

- Several of these sections are effectively modified by the Act, and

- Existing agency regulations based on these sections are tighter than the sections require, in light of the intent and provisions of the Act.

SUGGESTIONS

- There have been cases where agencies, particularly NASA, have allowed employees to leave a laboratory, obtain licenses to their inventions, and subsequently sell products based on the inventions to the Government. There appears to be adequate precedent for this type of agreement.

- The Act says that agencies can permit employees and former employees to participate in efforts to commercialize their inventions to the extent consistent with any applicable agency requirements and standards of conduct (paragraph 11(b)(4)). The agency requirements and standards of conduct need not be those in effect before the Act was passed. There appears nothing to prohibit agencies from making special provisions for use with the Act if they are needed.

- If existing standards or regulations must be waived, it may be wise to allow waivers on a case-by-case basis to handle early agreements until there is a body of experience.

- Probably the best way to protect an employee from a conflict of interest situation is to provide for his/her involvement with the private sector in a cooperative agreement with the laboratory.

4. STATUTORY PROVISION

> (B) If, in implementing subparagraph (A), an agency is unable to resolve potential conflicts of interest within its current statutory framework, it shall propose necessary statutory changes to be forwarded to its authorizing committees in Congress.

SUGGESTION

Most of the statutory restrictions apply to all agencies and agency-by-agency legislation is probably not the best way to resolve them. Further, the Executive Branch usually prefers administrative discretion to interpret laws over more detailed statutes. In light of intent of the Act, agencies should try to interpret existing statutes as permitting the types of individual involvement necessary to do what the Act anticipates. Agencies may plan to use the biennial Commerce report on implementation to identify problems and recommend statutory changes.

5. STATUTORY PROVISION

> (4) The laboratory director in deciding what cooperative research and development agreements to enter into shall --
>
> (A) give special consideration to small business firms, and consortia involving smfall business firms...

SUGGESTION

Complying with this should be easy in most cases. Technologies that require extensive resources and capitalization may be more than a small business can handle. Other technologies are suitable for small business commercialization for a variety of reasons, including their lack on investment in products that may be rendered obsolete by the technology. So long as a laboratory can show that it fairly considered or tried to find small business collaborators, there should be no problem. Section C of this paper offers suggestions for locating firms with which to collaborate.

6. STATUTORY PROVISION

> (4)(B) give preference to business units located in the United States which agree that products embodying inventions made under the cooperative research and development agreement or produced through the use of such inventions will be manufactured substantially in the United States and, in the case of any industrial organization or other person subject to the control of a foreign company or government, as appropriate take into consideration whether or not such

[illegible] firms...

foreign government permits United States agencies, organizations, or other persons to enter into cooperative reserch and development agreements and licensing agreements.

COMMENT

The first part of this involving domestic manufacture is easy. Universities do it all the time by including a standard paragrph in their cooperative R&D or licensing agreements. While the Act does not require domestic preference in licensing agreements, the requirement is in the Federal patent licensing statute, (35 U.S.C. 209) that laboratories must follow.

Nobody knows how to handle the second part about whether a foreign government would allow a U.S. firm similar opportunities to collaborate. It is not reasonable to expect most laboratory directors to know what other countries allow U.S. firms to do. Further, it can be difficult to determine who actually controls some multi-national concerns that appear to be domestic firms.

SUGGESTIONS

- Implement the first requirement on domestic manufacture by including a statement in the license or cooperative R&D agreement that the non-Federal party agrees to substantially manufacture in the United States products sold in the United States that use the invention or results of the cooperative R&D.

- Advise laboratory directors that until they receive more complete guidance, they should avoid cooperative R&D agreements or licenses with companies of other countries where they have reason to believe U.S. companies would not have similar opportunities. A rule of reason on what the directors can be expected to know should apply. It may be that export licensing restrictions will help eliminate countries where U.S. companies would not have similar opportunities.

- International competitiveness and better management of U.S. technology is becoming an significant political issue. In time, the Government may develop policies and information sources necessary for using this provision. Until that happens, labs that do not already have a program of international cooperation, should be advised to emphasize the domestic manufacture provision. As a practical matter, this and export controls may take care of most situations raised by the whole paragraph. Labs can also be advised to ask agency headqarters for guidance in foreign involvement situations.

7. STATUTORY PROVISION

(5)(A) If the head of an agency or his designee desires an opportunity to disapprove or require the modification of any such agreement, the agreement shall provide a 30 day period within which such action must be taken beginning on the date the agreement is presented to him or her by the head of the laboratory concerned.

SUGGESTIONS

- Initial delegation should be made to a level in the agency that understands both the Act and the operations of laboratories. The delegation should include authority to delegate further as appropriate.

- Consider a system where the level of approval required is a function to the magnitude of the agreement. Those that commit small amounts of a person's time or use of minor facilities could be approved at lower levels -- or approval waived completely.

- First-of-a-kind agreements or licenses might require higher approvals than subsequent, similar agreements or licenses. Agreements or licenses largely similar those already approved but which differ in some respects need only be reviewed for issues raised by the differences.

8. STATUTORY PROVISION

(5)(B) In any case in which the head of an agency or his designee disapproves or requires the modification of an agreement presented under this section, the head of the agency or such designee shall transmit a written explanation to the head of the laboratory concerned.

SUGGESTION

The written emplanation should be required to be transmitted to the head of the laboratory within the thirty day period.

9. STATUTORY PROVISION

(6) Each agency shall maintain a record of all agreements entered into under this section.

SUGGESTION

It might be useful to an agency's lab directors if summaries of agreements made by the agency's labs were circulated to them. In addition, Commerce is to report to the President and the Congress on agencies' use of the authorities in the Act every two years.

Information from agency records of agreements will probably be needed for this report.

B. SEC. 13. DISTRIBUTION OF ROYALTIES RECEIVED BY FEDERAL AGENCIES.

1. STATUTORY PROVISION

(a) IN GENERAL--(1) Except as provided in paragraphs (2) and (4), any royalties or other income received by a Federal agency from the licensing or assignment of inventions under agreements entered into under section 11, and inventions of Government-operated Federal laboratories under section 207 of title 35, United States Code, or under any other provisions of law, shall be retained by the agency whose laboratory produced the invention and shall be disposed of as follows:

COMMENT

This paper will not suggest how agencies should implement the royalty distribution provisions of the Act, but it will offer some factors that agencies may consider in making their decisions. Paragraphs (A) and (B) together indicate that the royalty distribution provisions take effect in F.Y. 1987.

2. STATUTORY PROVISION

(A)(i) The head of the agency or his designee shall pay at least 15 percent of the royalties or other income the agency receives on account of any invention to the inventor (or co-inventors) if any inventor (or each such co-inventor) was an employee of the agency at the time the invention was made. This clause shall take effect on the date of the enactment of this section unless the agency publishes a notice in the Federal Register within 90 days of such date indicating its election to file a Notice of Proposed Rulemaking pursuant to clause (ii).

SUGGESTIONS

Historically, Research Corp. required universities to pay faculty inventors at least 15 percent of royalties from inventions licensed by Research Corp. Since then, many universities have increased the inventor's share. One popular approach involves a sliding scale, with a large perentage for relatively small amounts and decreasing percentages for greater amounts. Agencies may begin at 15 percent and consider increasing the percentage at a later date.

3. STATUTORY PROVISION

(ii) An agency may promulgate, in accordance with section 553 of title 5, United States Code, regulations providing for an alternative program for sharing royalties with inventors who were employed by the agency at the time the invention was made and whose names appear on licensed inventions. Such regulations must--

(I) guarantee a fixed minimum payment to each such inventor, eacy year that the agency receives royalties from that inventor's invention;

(II) provide a percentage royalty share to each such inventor, eacy year that the agency receives royalties from that inventor's invention in excess of a threshold amount;

(III) provide that total payments to all such inventors shall exceed 15 percent of total agency royalties in any given fiscal year; and

(IV) provide appropriate incentives from royalties for those laboratory employees who contribute substantially to the technical development of a licensed invention between the time of filing of the patent application and the licensing of the invention.

COMMENT

Subparagraph (III) is particularly important. It requires employees whose inventions produce royalties to be identified and to receive as a group, at least 15 percent the sum of the royalties their inventions produce. With this requirement, the discretion in the entire alternative appears limited to:

- Whether to share more than 15 percent of the sum of the royalties received by the agency with this group of employees,
- How to distribute the royalties received among these inventors, and
- Whether to use royalties in excess of at least 15 percent as an incentive to other employees who contribute to technical development of in invention that becomes licensed. (Note, Section 12 also provides for rewards for scientific, engineering, and technical personnel.)

The alternative system is not for use with employees whose ideas or inventions are of value to the Government but cannot be licensed for royalties. Section 12, provides for these people.

There are probably two major considerations in deciding on the amount of the fixed minimum payment under subparagraph (I).

- o To serve as an incentive, the payments should be large enough to be recognized as significant by inventors, and

- o The payments must continue for as long as a license produces royalties. A high payment could result in an inventor receiving significantly more than the invention brings in, prticularly as royalties diminish toward the end of the productive period,.

Among the major considerations in deciding on the percentage payment under subparagraph (II) are:

- o The threshold amount is probably to provide funds for paying the fixed minimum amount under subparagraph (I). This might be determined once for the life of the plan. Alternatively, it might be calculated each year by a formula that considers the total paid under (I).

- o The percentage might be applied to the royalties produced by the inventor's own invention, or it might be applied to the sum of the royalties received by the agency.

Taken together, subparagraphs (I) and (II), allow an agency to design a range of alternatives from,

- o identical payments for all inventors whose inventions produce royalties, to

- o payments in proportion to the amount of royalties produced by each employee's own invention.

An identical payment scheme would create an incentive to get an invention licensed, regardless of the amount of royalties it may produce, in order to share in the pool. A proportional system would add an additional incentive to get the invention used widely in order to increase the royalties it produces.

C. SELECTING ORGANIZATIONS WITH WHICH TO ESTABLISH COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS.

Close cooperation between a Federal laboratory and a commercial firm is a new type of relationship that is foreign to the culture of most Government employees and managers. They have a legitimate concern that relationships with the private sector both be fair and appear fair. However, the culture of industry is to maintain secrecy around actions that may affect future products. Much of the trick in establishing collaborative R&D agreements is to bridge both cultures. The way a laboratory

decides whom to accept as a cooperator is an important factor in both the appearance and actuality of fairness. This is particularly true where the industry partner will obtain a degree of exclusivity in the results. Labs will have to exercise some ingenuity in organizing their opening gambits, but here are a few ideas.

There are three primary avenues by which a laboratory and a private sector firm might be brought together in a cooperative R&D agreement. These are through:

- o A firm's desire or willingness for the laboratory to aid in further development and commercialization of a laboratory invention.
- o The laboratory's efforts to find a collaborator to participate research or in developing a particular technology.
- o A firm coming to the laboratory to collaborate in research or to develop a particular technology.

1. If the cooperation stems from an existing laboratory invention, there are two major ways to ensure fairness.

(a) Advertising the invention as available for licensing through NTIS publications, agency fliers, industry contacts, use of intermediaries, and other dissemination techniques will expose the invention to possible licensees.

(b) The Federal patent licensing regulations (37 C.F.R. Ch. IV) based on 35 U.S.C.208, establish a process for determining the best potential licensee for a Government-owned invention and includes a Federal Register requirement for exclusive and partially exclusive licenses. While cumbersome and at times self defeating, the regulations provide for a selection process that is perceived as fair.

2. If the laboratory tries to find a collaborator to help conduct research or develop a technology for which no property rights have yet been established, there are several factors and approaches to consider.

(a) While the procurement rules do not apply the cooperative R&D agreements, part of the sense of a need for an open process for comes from the requirement for competitive procurements. However, there is provision for a sole source exception under the procurement rules when procuring R&D that it involves unique ideas and it makes sense to deal with those who have the ideas. This view might guide labs in entering into cooperative R&D agreements but they should be sure to have a recorded justification of their action.

(b) The lab could publish notices that it is seeking a cooperating party. It could use the Federal Register as a formality, but scientific, professional, and trade journals and associations would probably be more effective.

(c) Depending on the structure of the industry, the lab could contact the firms it believes most likely to be interested and negotiate with those who respond.

(d) The lab could organize the project in conjunction with a university or unit of State or local government as a partner or intermediary. Allowing the partner or intermediary to select company or companies could remove the choice from the laboratory. This may be useful where lower levels of government or universities are ahead of the Federal Government in establishing relationships with industry that are closer than arms-length.

(e) The lab could list its search with the FLC, NTIS, and other intermediaries who could direct candidatets to the lab.

3. Handling cases where a firm approaches the laboratory with a request to collaborate in research or in developing a technology on which the Government holds no patents, can be divided into two time periods.

- Requests received before the lab is able to make an general announcement of its willingness to enter into cooperative R&D agreements, and

- Requests received after the lab has made an announcement.

(a) It appears that a laboratory can announce its willingness to consider coopertative R&D agreement proposals in fields of science or technology, to be acted on at the lab's convenience. The announcement can provide for a first-come, first-considered selection process, or one that accumulates proposals for while and then picks the most desirable. The announcement, could offer confidentiality for the proposals and present the general agreement terms the lab would offer and require. Once a lab makes this sort of announcement, and follows a rational selection process, it would probably have met the requirements for both actual and apparent fairness. With the general announcement made in advance, no additional publication should be needed for a specific agreement.

(b) The problem may be greater if a proposal is received that leads to a cooperative R&D agreement before an announcement is made. This may be primarily a start-up problem, but it could occur any time a firm offers a proposal in a field not covered by a lab's announcement. It might be good if the company would agree to a public notice of the proposed agreement, but delay,

possible actions by competitors, and publicity could lead a company to reject the idea. Many labs have service for others programs that make lab facilities available to companies for proprietary work. The policies on deciding who can participate in these programs may be a useful and realistic precedent. It may be possible to work though a university or governmental intermediary to remove the selection onus from the laboratory. Finally, the view discussed above (2(a)), that R&D aggreements don't fit the normal openness mold of procurement might be applied.

D. COOPERATIVE RESEARCH AND DEVELOPMENT PROJECTS WHERE THERE ARE OR MAY BE FEDERAL AND NON-FEDERAL CO-INVENTORS

For years, some agencies have funded organizations to perform R&D and assigned lab employees to work on the same project. This lead to inventions made by Federal and non-Federal co-inventors which in turn led to grief because of confused ownership and unequal treatment of the co-inventors. The Act can be used in conjunction with the Bayh-Dole Act (P.L. 96-517 as amended by 98-620, 35 U.S.C. 200-210), its implementing regulations (37 CFR Part 401), and the 1983 Presidential Memorandum on Patent Policy to resolve or avoid many of these confused situations.

There are three significant variables:

- The type of funded organization -- nonprofit, or
  -- for-profit .
- The formal agreements between the laboratory and funded organization -- a grant or R&D contract alone, or
  -- a grant or contract supplemented by a cooperative research and development agreement authorized by the Act.
- Whether the invention -- already exists, or
  -- may be made in the future.

Suggested treatments for the eight possible combinations of these variables follow.

1. Nonprofit organization, grant or R&D contract alone, existing invention.

Paragraph 37 CFR 401.10 on assignment to contractors of rights in inventions of government employees says:

> "In any case when a Federal employee is a co-inventor of any invention made under a funding agreement with a small business firm or nonprofit organization and the Federal agency employing such co-inventor transfers or reassigns the right it has acquired in the subject invention from its

employee to the contractor as authorized by 35 U.S.C. 202(e), the assignment will be made subject to the same conditions as apply to the contractor under the patent rights clause of its funding agreement. Agencies may add additional conditions so long as they are consistent with 35 U.S. C. 201-206."

Translated, this says that when an employee of an R&D contractor (or grantee) and a Federal employee are co-inventors, the Federal agency may assign its rights to the contractor. The agency is not required to assign rights. But if it does, the contractor should have nearly identical conditions on the assigned rights as on the rights obtained through its own co-inventor under the contract. Since there is no authority to require the contractor to pay royalties to the funding Federal agency, it should not be required to pay royalties under the assignment.

Paragraph (k) of the standard patent rights clause in 37 CFR 401.14 is on special provisions for contracts with nonprofit organizations, and says:

> "The contractor will share royalties collected on a subject invention with the inventor, include Federal employee co-inventors (when the agency deems it appropriate) when the subject invention is assigned in accordance with 35 U.S.C. 202(e) and 37 CFR 401.10."

Agencies have had this authority to allow a nonprofit contractor to share royalties directly with a Federal co-inventor for several years. Some agencies were reluctant to use it, however, because Federal inventors generally did not receive royalties. The Act makes it clear that now, Federal inventors are to receive a royalty share. The simplest way an agency or lab can provide for co-inventors of existing inventions under grants or contracts with non-profit organizations is to obtain an agreement from the grantee or contractor to make payments directly to the Federal employee.

2. Nonprofit organization, grant or R&D contract alone, future invention.

The previous discussion also applies when inventions are made in the future by Federal and nonprofit contractor co-inventors. So the basic funding agreement is not supplemented by a cooperative R&D agreement developed under the Act, future inventions will have to be treated like existing inventions.

3. Nonprofit organizations, grant or contract supplemented by a cooperative R&D agreement authorized by the Act, existing invention.

The discussion under 1 applies here also. The Act does not give a lab any authority to assign existing inventions beyond what is already in 37 CFR 401.10.

4. Nonprofit organizations, grant or contract supplemented by a cooperative R&D agreement authorized by the Act, future invention.

A lab may provide for the participation of its employees on a project with a contractor through a cooperative R&D agreement that supplements the contract. Subparagraphs 11(a)(1), and (b)(2), of the Act allow laboratories to agree in advance to license or assign inventions made under cooperative R&D agreements. Thus, a lab can agree to assign to the contractor under the terms of 37 CFR 401.10, its rights gained through a lab employee co-inventor. If the contract and agreement are with a nonprofit organization, the agreement can include provision for sharing royalties with the Federal co-inventor.

There is an inconsistency of purposes and provisions here. On the one hand, the intent of 401.10 is to allow a contractor to have clear title to all shares of an invention on a single set of terms. Thus, the suggestion that a lab should not try to obtain royalties for more than its employee co-inventor. It is felt that to obtain a share for the agency or lab would reduce the incentive for the contractor to commercialize the invention, even if the Government funded most or all of the contractor's work.

On the other hand, the Act presumes that when an organization enters into a cooperative R&D agreement with a lab, using the firm's own resources, the lab can require it to pay royalties on commercial use of resulting inventions. This will take time and patience to sort out.

5. For profit organization, grant or R&D contract alone, existing invention.

Although the Bayh-Dole Act was writen to apply to small business and nonprofit organizations, the Presidential Patent Policy Memorandum of 1983 directed agencies to extend its policies to all R&D contractors to the degree permitted by law. Only NASA and DOE are believed to have statutes that restrict application of the Memorandum. In this and the following cases, all for-profit organizations, are considered the same regardless of size.

Federal policy is deliberately silent on whether for-profit firms should share royalties with their inventors. This is purely an individual firm's business. The subparagraph on sharing royalties quoted under 1 above (401.14(k)(2)) does not apply to for-profit firms.

While there is no general provision for a lab to collect royalties under an assignment, it may be possible to negotiate a

On the other hand, the lab

small return for the Federal co-inventor. Subpragraph 13(a)(1)(A) requires agencies to share at least 15 percent of the royalties received with laboratory inventors. When a lab has negotiated for a small royalty return for the co-inventor only, it should give 100 percent to the employee co-inventor.

Although subparagraph 11(a)(2) of the Act authorizes labs to license their inventions, the licensing regulations of 37 CFR Ch. IV, including the requirement for a Federal Register notice apply. A contractor mignt not find a license acceptable in lieu of an assignment, and this alternative was not anticipated or provided for under the Bayh-Dole Act for co-inventor situations.

6. For profit organization, grant or R&D contract alone, future invention.

The previous discussion applies. Nothing in the Act allows for differing treatment of future inventions unless provided for in a cooperative R&D agreement.

7. For-profit organizations, grant or contract supplemented by a cooperative R&D agreement authorized by the Act, existing invention.

Nothing in the Act allows for assigning existing inventions that were not made under a cooperative R&D agreement.

8. For-profit organizations, grant or contract supplemented by a cooperative R&D agreement authorized by the Act, future invention.

As with a nonprofit organization (4 above) a cooperative R&D agreement can be established with a for-profit firm that provides for participation of lab employees in a contract funded project. In the agreement, the lab can promise to assign to the contractor, its rights to inventions gained through a lab co-inventor.

There might also be cases where the cooperative R&D agreement is the primary instrument, and a grant or R&D contract is made as a supplement. In these cases, the firm's rights to joint inventions would probably be established first in the cooperative R&D agreement. The lab might negotiate a significant royalty return to the agency, only part of which would go to a lab employee co-inventor. This is related to the confusion discussed under 4 above.

Session 1: National Policy for Technology Transfer

This session provides a broad perspective of the evolution of Federal policy and Congressional intent with respect to technology transfer efforts. The economic and political rationale underlying the Federal government's support of research and development will be covered, and legislative enactments between 1980 and 1986 will be discussed to illustrate the expanding authorities and responsibilities Congress has given the Federal laboratories in an effort to facilitate the commercialization of government technology by transfer to the private sector.

- National Technology Policy: WWII to Present
- Rationale for Federal Support for R&D
- Legislation: Expanding Authorities Granted to Laboratories
  - Stevenson-Wydler Technology Innovation Act of 1980 (Public Law 96-480)
  - Bayh-Dole Act (Public Law 96-517) - 1980
  - Presidential Memorandum - February 18,1983
  - Trademark Clarification Act of 1984 (Public Law 98-620)
  - Federal Technology Transfer Act of 1986 (Public Law 99-502)
  - Executive Order 12591 - April 10, 1987
- Important Authorities Granted to the Different Types of Laboratories
- Summary
  - General Direction Congress is Moving
  - Unresolved Issues

Accompanying Materials

- Matrix: Legislative Authorities Given to Federal Laboratories and Agencies
- Matrix: Authorities: Rights to Technologies
- Matrix: Authorities: Licensing
- Matrix: Authorities: Incentives
- Legislative Authorities and Actions, Government-Operated Laboratories
- Legislative Authorities and Actions, Nonprofit Contractor-Operated Laboratories
- Public Law 96-480, as amended by Public Law 99-502
- Public Law 96-517, as amended by Public Law 98-620

- Executive Order 12591 - April 10, 1987

Session 2: Nature of Technology and Technology Transfer

Technology cannot be transferred efficiently unless one has a firm understanding of what technology is. This session will approach technology from the perspective of: (1) technology as a realm of activity concerned with the making and doing of useful things; and (2) technologies as the means by which useful things are made as well as the useful things themselves. Technology will be contrasted with science, and their interrelationships will be described, since much laboratory work is scientific in nature. This understanding of technology and technologies will then be manifest in a definition of technology transfer applicable to the laboratories and offering the laboratories a wide range of transfer options. This range will serve as an introduction to the next session (Principles and Mechanisms) and will provide a broad conception of transfer activities before the course concentrates on the more limited realm of patentable items.

- Nature of Technology
  - The technological realm
  - Technology as making
  - Technologies as things made
  - The functional essence of technology
  - The significance of material embodiments
  - Science and technology
- Technology Transfer
  - Types of transfer
  - Prevailing images
  - Problems connected with current representations
  - A proposed definition
  - Applications of the definition
- Dimensions of Transfer
  - Transfer of technology and technologies
  - Personal dimensions of transfer
  - Science as a contributor to technology

Session 3: Implementation Principles and Mechanisms

With an understanding of technology and technology transfer firmly in hand, Session 3 will delineate basic implementation principles, such as that transfer is a cooperative transaction between two parties. The intent of this session will be to move the participants away from a concept of transfer as unilateral activity concerning discrete items and toward a concept of transfer as cooperative activity in which transferable items emerge during the process of cooperation. A broad range of transfer mechanisms will be discussed in keeping with the extended concept of technology presented in Session 2, before the course centers on those mechanisms accentuated in recent legislation (i.e., patents and licensing and cooperative research).

- Implementation Principles
  - Purpose of technology transfer
  - Thinking about technology in the transfer context
  - Transactions between organizations
  - The need for development work
  - Focusing on the private sector
  - Technology transfer as a people process
  - Basics of setting up a program
- Types of Mechanisms
  - Patents and licensing
  - Personnel exchange
  - R&D cooperative research agreements
  - New venture startups/innovation centers
  - Demonstration projects
  - Contract research
  - Technical assistance/education/training
  - User facilities and equipment
  - Publications
- Criteria for Selecting Appropriate Mechanisms
- Methods to Encourage Laboratory/Industry Interaction
  - Seeking transfer opportunities: increasing personal interactions
  - Industry activities
  - Laboratory activities
- Getting the Word Out

Session 4: The Innovation Process: Basic Concepts

The purpose of this session is to provide an introduction to the technological innovation process. An understanding of the innovation process is important because the Federal laboratories are involved in innovation processes through their primary mission work and are now mandated to be involved in other innovation processes through technology transfer efforts. The session will clarify four key terms (technology, invention, product, and innovation) within the context of a state-of-the-art schematic of the innovation process. This discussion will serve as an introduction to the next session, which will deal with private sector concerns related to innovation.

- Basic Terms
  - Process
  - Innovation
  - Technology
- Discussion Parameters
  - Materially embodied technologies
  - Non-materially embodied technologies
- Reasons Why We Should Be Interested in Innovation Process
- Simple Schematic of the Process
  - Creation
  - Development
  - Adoption
  - Adoption as focus of the process
- Modified Schematic
  - Reasons for why modifications needed
  - Historic dimensions of innovation
  - Innovation in the company setting
  - Feedback mechanisms
  - Functions of R&D

- Simple Schematic of the Process

Session 5: Technology Transfer, Innovation, and the Private Sector

This session introduces the private sector perspective. Key concepts related to invention, innovation, and technology transfer are discussed within the context of the private sector's role in commercializing technology. The purpose of this session is to provide laboratory personnel with a basic understanding and appreciation of the motives, operational procedures, and requirements that drive the private sector's participation in the innovation process and in technology transfer efforts.

- The Forms of "Technology"
- Inputs to the Creation of Technology and to its Subsequent Use through Innovation and Technology Transfer
- Outputs of Technology Transfer and Innovation
- What Drives the Pursuit of Science, Technological Development, and Innovation?
- Industrial Motives for Pursuing Innovation
- The Cost Structure of Innovation
- The Influence of Market Structure on Technology Transfer
- Popular Myths about Technology Transfer and Innovation
- Major Resistances to Technology Transfer and Innovation
- Preconditions for the Sale or Transfer of Technology
- Time as a Factor in Technology Transfer and Innovation
- Public Policy and Technology Transfer

- The Influence of Market Structure on Technology Transfer

Session 6: Management of Technology Transfer

This session is intended to serve as a bridge between the sessions of Day 1 that have addressed policy and principles, and the sessions of Day 2 that will focus on tactics and implementation. The session summarizes the the opportunities and pitfalls of technology transfer, and serves as an introduction to the concept of technology management.

- Review of the Definition of Technology
- Awareness and Identification
- Classification and Evaluation
- Transfer Strategies
- Markets and Marketing
- Participants: Contributions and Conflicts
- Rewards and Motivation

Session 7: Actors in the Technology Transfer Process

The various potential actors in the transfer process will be introduced in this session. The actors are discussed after Session 6 on the Management of Technology Transfer, since the actors should be looked at as management tools. Some of the actors that will be discussed include the ORTA, NTIS, the FLC, technology "champions," and brokers. Basic functions as well as usefulness under different transfer circumstances will be described.

- Private Sector Parallels
  - Technology transfer as an internal company problem
  - Emerging solutions (e.g. project teams)
  - Transfer actors (e.g. product champions)
- Internal Resources
  - Bench scientist
  - Department manager
  - ORTA
  - Lab management
  - Agency management
- Setting Up The Transfer Office
- Dealing With The Private Sector
  - Company management
  - R&D offices
  - Product champions
- External agents
  - Brokers
  - FLC
  - DOC

Session 8: Cooperative Research: Opportunities and Limits

There are opportunities for cooperative efforts with industry, universities, and other Federal laboratories. This session provides an understanding of the role of cooperative research in the innovation process. A framework is presented for assessing opportunities and probable outcomes in establishing cooperative research ventures. Parallels with the university experience in developing cooperative research centers are noted.

- Cooperative Research: Relation to Innovation and Technology Transfer
- Types of Cooperative Agreements
- Benefits to Participants (Industry and Laboratory)
- University Experience in Consortia Arrangements
- Expected Outcomes from Cooperative Arrangements

Accompanying Materials

- National Cooperative Research Act
- Organizational Structures of Cooperative Research Programs (NSF and MCC)
- Considerations in Establishing Cooperative Research Agreement: The University Experience
- Operation of Cooperative Research Programs
- Sample Agreements
- List of Consortia Approved by U.S. Justice Department
- References

Note - GSRI will argue that multi-company cooperative research may work for process technology, but should not normally be used for product technology.

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Session 9: Intellectual Property: Patents and Licenses

This session provides a working understanding of the concept of "intellectual property" and its various forms. The discussion outlines the purposes of obtaining protection, uses of intellectual property in the private sector, and the role of patents, licenses, and copyrights in transferring technology.

- Definitions
  - Patents
  - Copyrights
  - Statutory invention registrations
  - Trade secrets: alternative to patents; use in government laboratories
  - Trademarks
- Issues in Patenting Inventions
  - Documentation
  - Publication: conflicting goals and implications for future legal protection
  - Decision to patent
  - Working with patent attorneys
  - Foreign Patents
- Protection of Computer Software
- Negotiating Licenses
  - Business considerations in patents and licensing
  - Relationship of patents to licensing
  - Exclusive versus nonexclusive
  - Other license provisions
    - Confidentiality agreements
    - Sublicenses
    - Royalties
- Joint research ventures: special problems and considerations

Session 10: Conflicts of Interest as a Management Issue

Increased emphasis on technology transfer as a major responsibility for the laboratories may present several practical problems for laboratory management and personnel. The purpose of this session is not to lay down specific rules for management, but to define the issues and suggest a framework to view the parameters for consideration in making personnel decisions on a case-by-case basis.

- Commercialization and Use of Public Funds
- Laboratory Environment, Character, and Values
- Organizational Conflict of Interest
- Organizational Conflict of Commitment
- Personnel Conflict of Interest

Session 11: The Concept of Technology Portfolio

Developing and managing technologies and technology transfer opportunities requires an individual to make time and money investment decisions under uncertain conditions (risk). Viewing an individual technological opportunity within a broader portfolio context allows one to either increase the return for any specified degree of risk or decrease the risk associated with any specified rate of return.

- The Portfolio Concept
  - Introduction: Basis and Purpose of Portfolio Theory
  - Conceptual Development: Risk, Returns and Portfolio Effects
- Technology Portfolios
  - Management of a selected group of technology transfer opportunities in combination in order to increase the expected return or to reduce risk
  - A specified technology transfer opportunity may be quite risky when held in isolation but not very risky when held in a portfolio
  - What is being invested (from the laboratory perspective)
  - Returns
  - Combinations of technology transfer mechanisms
  - Combinations within mechanisms

Session 12: Classifying, Evaluating, and Managing Technology

This session is aimed at describing, understanding, evaluating, and managing new technology from various perspectives. The material outlines how and why information and data are collected in the classification process, and how they are used to evaluate and manage new technologies from both the government and private sector orientation.

- Why Classify Technology?
- General Criteria for Establishing and Maintaining an Effective Documentation/Classification System
  - Selection of appropriate attributes
  - Collection of only the important information
  - Need to develop "quick and dirty" evaluation criteria at various stages
  - Tailoring the system to the particular needs of the institution
- Evaluating Technology for Transfer
  - Attributes used in estimating the value of a technology from different perspectives (government, private sector, manager, financial, sales, etc.)
  - Identification of potential applications
- Commercialization Strategy
- Managing Laboratory Technology
  - Using a technology portfolio management system
  - Tracking a technology through the innovation process

Session 13: Introduction to Technology Value and Pricing Issues

Explicit or implicit judgements are made about value and price in arriving at any bargain made on an arm's-length basis. By determining what constitutes "value," the link between value and price can be established. Although the discussion is general, the specific dimensions of pricing technology are considered, including the constraints associated with a technology's Federal laboratory origin.

- Value to be Found in Technology Transfer; What's Really for Sale?
- Evidence of Value in a Technology
- Who Values Technology?
- Alternative Means of Valuing a Technology
- Pricing Technology: Art or Science?
- Dimensions of Price
- Dealing with Exclusivity--and the Lack Thereof
- Limits on Price and Pricing Mechanisms for Federal Laboratory Technologies

Session 14: Technology Markets and Marketing Technology

Innovation is always intended to create new markets or to enhance a firm's position in an existing market; therefore, successful technology transfer and innovation efforts must be market-oriented. The session is intended to increase the awareness of laboratory personnel of the importance of markets both in developing technology and in its subsequent transfer. Also, in marketing available technology to the private sector, laboratory personnel should be aware of the buyer's perspective. Methods based on market relevance are suggested to assist technology managers to locate industrial prospects and to elicit interest in transferring a laboratory technology.

- Markets and Market Relevance
  - What constitutes a "market"?
  - Supply-push and demand-pull in technology markets
  - Concept and role
  - Determining market relevance
  - Use of market relevance in technology transfer
- Marketing Technology
  - Your competition
  - How industry views and evaluates an opportunity
  - Sources of information on industry needs
  - Establishing a marketing database
  - The marketing "package": What, exactly, are you offering?
  - The marketing process
    - Broad (passive) approaches
    - Targeted (active) approaches