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UNIVERSITY TECHNOLOGY TRANSFER

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Technology transfer is defined as the movement of knowledge from a laboratory where the technology is developed to the private sector where commercialization can occur. At most research universities where basic and applied research is encouraged and rewarded, it has been difficult to add the next stage of commercializing the products of this research. However, New Mexico State University has made significant progress in this area with economic growth and development occurring as a result.

Before I illustrate how this progress may occur, I will review briefly the development of land-grant universities and their role in technology transfer. For those of you who have passed through the halls of NMSU or other similar universities, you know the equal importance that is placed on education, research, and service. You may also remember that the Morrill Act of 1862 allocated public lands for the establishment of colleges of agriculture in all states with the intent of assisting farmers in utilizing knowledge created at land-grant universities. In 1914, the Smith-Lever Act created the Cooperative Extension Service which has been the principal transfer agent of the technology from universities to the agri-business community. In 1986, the Federal Technology Transfer Act was passed to enhance the flow of scientific as well as technical knowledge from federal and non-federal laboratories to the private sector. That act was

fine-tuned in 1989 and is now known as the National Competitive Technology Transfer Act. Senators Domenici and Bingaman were instrumental in sponsoring these bills which will enhance the transfer of technology from all national laboratories to the private sector. In New Mexico, these laboratories are Los Alamos National Laboratory, Sandia National Laboratories and Phillips Laboratory. This process is clearly a national goal, and state universities have an important role to play.

An example of how technology may be transferred from a national laboratory to a new high-tech company can be found in the following story. A few weeks ago, a physics professor came to my office and reminded me that his research depends heavily on listening devices; the more sensitive the instrumentation, the more significant will be his research. He also believes that Sandia National Laboratories (SNL) possesses the technology, heretofore classified, which could expand the capabilities of available scientific instrumentation for his research. Therefore, he was willing to consider establishing a company in the university's Arrowhead Research Park that would fabricate more sensitive instruments if SNL would transfer the technology to his company. Given the demand for improved listening device technology and recent federal legislation which encourages the transfer of such technology, it may indeed be possible to move that knowledge from SNL to a new start-up company in

Las Cruces which would manufacture and market the instruments worldwide.

I will use this example to answer several questions which I must always consider when implementing technology transfer. First, what is the source of the technology? Second, to what organization will the technology be transferred? Finally, what will be the results of this transfer?

In the example I gave, SNL (i.e., the federal government) is the apparent owner and source, but not necessarily. Before applying for any patent application or concluding the sale of any technology, the ownership question must be resolved between the inventor and the employer. About ten years ago SNL would have owned the technology; however, since then the federal government has changed its position and now allows the inventor(s) to claim ownership and receive a negotiated percentage of all royalties and licenses. At NMSU, I always ask inventors to identify in writing the ownership of the intellectual property. If a faculty or staff member develops a patentable device, the university, and therefore the state, claims ownership. If the university obtains patent protection and also commercializes the invention, the inventor will receive fifty percent of the proceeds after covering all protection costs. We believe that this is a fair reward for the discovery and a good incentive for faculty and staff to work with us in the development and transfer of intellectual property to the private sector.

Concerning the second question, the federal government always prefers to transfer the technology to an organization that will maximize its commercialization potential. This means that SNL would rather transfer the sensing technology directly to the private sector rather than through the university to the start-up company. Even though the federal government looks more favorably on the transfer of this technology to American rather than foreign companies, a request for a proposal (RFP) will usually be published by a federal department or agency so that any company can compete. However, a private citizen also has the opportunity to request technology from any national laboratory to augment an activity already underway; i.e., a manufacturing process.

The third question concerns the results obtained following the transfer of technology. The creation of a start-up company at the university's research park, which may actively involve technology formerly dormant at a national laboratory, illus-

trates the economic benefit which comes from the implementation of the earlier mentioned National Competitive Technology Transfer Act. For several decades, universities have encouraged the creation of spin-off high technology companies; Stanford University and the adjacent "Silicone Valley" represent the best illustration of this relationship.

Historically, scientists at universities and national laboratories have not been interested in actively identifying and pursuing the transfer of commercially viable research results. Recently passed federal legislation, however, has changed the incentives available to federal employees, and universities are changing their policies so that faculty and staff also benefit from the commercialization of their inventions. The example of SNL's technology and its possibilities for NMSU illustrates the progress that is being made in this area. Although the negotiations with SNL have not been completed, discussions are underway, and the NMSU physics professor anticipates good results.

For decades land-grant universities have excelled in the transfer of agricultural knowledge to agri-business industries, and our success as exporters of agricultural products is testimony to that achievement. Now we must become just as successful in transferring technology from scientific and engineering laboratories to manufacturing industries so that our national competitive position is not lost to other countries.