

# **UNIVERSITIES UNDERTAKING WATER RESOURCES SECURITY RESEARCH: ISSUES FOR CONSIDERATION**

**Jonathan W. Bulkley**

The School of Natural Resources and Environment  
University of Michigan, Ann Arbor, Michigan 48109-1115  
Phone: 734-764-3198; jbulkley@umich.edu

## **INTRODUCTION**

Terrorists' acts have demonstrated the vulnerability of infrastructure systems. Until and unless the root causes leading people to undertake these terrorists' acts are addressed and mitigated, one can expect that attempts to inflict major damage and loss of life will continue in the future. It is clear that research is absolutely essential to identify and develop new and innovative means to harden existing water resource infrastructure systems in order to reduce their current vulnerability to such terrorists' acts. Research is also needed to enable new infrastructure to be designed and built in order to minimize the potential for being vulnerable to such terrorist acts. It is also clear that universities in this country may have a major role to play in carrying out this needed and necessary research. A major role of the university in society is to generate new knowledge and disseminate this knowledge for the benefit of society broadly defined. During and following World War II, many research universities undertook and carried out classified research determined to be in the national interest. During the Vietnam War, public pressure led to the discontinuance or separation of a number of these activities from the sponsoring universities. In the past, the graduate students and faculty members who performed classified research at universities were typically U.S. citizens. At present, many faculty members and graduate students, especially in engineering and science, at research universities are foreign nationals. One immediate issue is who will perform classified research at universities now and in the future. Furthermore, what security measures will be implemented to provide appropriate security clearances for those faculty and students undertaking this type of classified research. Secondly, if one has appropriate faculty and student researchers who have received the needed security clearances to perform the research work, how does the university proceed to fulfill its historic mission to contribute new knowledge through the dissemination of its research findings? Publication of research results designed to harden water resource infrastructure systems could also serve as a guide for those seeking to undertake terrorist acts. It is anticipated that the research funding to support protection of water resource infrastructure systems will only increase in the future. Examination and consideration of the issues presented in this paper need to be undertaken to clarify the process and procedures to be utilized by universities engaged in research to reduce the vulnerability of water resource systems to terrorists' acts.

## **EXISTING POLICY FRAMEWORK**

Prior to 9/11/01, existing federal rules and regulations were designed to deny visas to students from certain countries designated as "state sponsors of terrorism" to undertake studies in any of 16 categories specified on a Technology Alert List. These 16 categories range from

conventional munitions to high performance metals and alloys. They primarily focus on categories with direct military application. One category addresses chemical and biotechnology engineering. It is concerned with the development of biological and toxin agents. Following the World Trade Center bombing attack in 1993, new federal legislative acts created an electronic tracking system for foreign students and required laboratories transporting hazardous biological agents to register. P.L. 107-56, PATRIOT ACT/USA, signed by President Bush on October 26, 2001 provided for the following:

“...increased foreign student monitoring, restricted access of potential terrorists to hazardous biological agents, and gave the government access to some information about students and their Internet usage. The government has issued regulations and imposed new guidelines about: withdrawing scientific and technical information from federal agency websites and limiting information to ‘sensitive, but non-classified’ information; reclassifying already released materials; limiting access to information accessible via Freedom of Information Act; and expanding the list of technologies subject to export control.” (Kenzo, 2002)

The President of MIT, Charles M. Vest, offered three suggestions for both the scientific community and the federal government to consider regarding issues that embrace both research and the generation of new knowledge; this role of scientific inquiry needs to be balanced together with proper and appropriate security against those terrorists who would do harm against this country and our citizens. He states that our society must not implement actions that will limit scientific discovery and advancement that is so vital to our economy. He further observes that the process of knowledge creation thrives in the open exchange of information and is limited if such exchange and sharing is overly restricted. Accordingly, his three suggestions as to how we may proceed to achieve a balance between security and scientific openness are as follows:

1. Ensure continuous consultation by the federal government with the scientific community in order to communicate the real risks associated with the work of scientists. This is a complex task especially as one considers basic research undertaken in the context of terrorist threats.
2. Establish distinct boundaries between classified research and unclassified research. Do not utilize vague criteria or ill-defined terms such as ‘sensitive but unclassified information.’
3. Undertake to utilize voluntary agreements within the scientific community in order to develop and implement new mechanisms appropriate to our security needs and the requirements of science. Simplistic lists of forbidden topics will not work in today’s fast paced fields of inquiry. (Vest, 2002)

There are examples that raise questions regarding the potential that information made widely available may be turned against our society by determined terrorists. (Kenzo, 2002)

## **POTENTIAL IMPLICATIONS FOR UNIVERSITIES**

Beyond the rules, regulations, and guidelines already in place, additional measures may be implemented to further limit access to sensitive information. One immediate issue is the fact recent information demonstrates that at least 33% of all U.S. doctoral recipients in U.S. science and engineering programs are foreign students. Furthermore, 52% of all U.S. doctoral recipients in engineering alone are foreign students. (Kenzo, 2002). Accordingly, universities that have

significant numbers of foreign graduate students in engineering and science may find a decline in future enrollments of these graduate students from overseas. Not only does this have a potential impact on revenue, it also may adversely impact on the strength of science and technology in the future for this country.

The Homeland Security Act of 2002 (PL 107-296) signed by President Bush on November 19, 2002 authorizes \$500 million for FY 2003 for the Director of the Homeland Security Advanced Research Project Agency (modeled after the Defense Advanced Research Project Agency) to award competitive, peer reviewed grants, cooperative agreements, or contracts to public or private entities including universities. The areas of expertise in the field of water resources currently cited for inclusion in such university centers includes water and wastewater operations, port and waterway security, multi-modal transportation, and nationally recognized prer opey088 pey12 0 0 12 36

## CHALLENGES FOR UNIVERSITIES

There are numerous challenges and opportunities currently facing universities in this country directly related to the undertaking of research to contribute to the protection of critical water infrastructure systems. Means need to be found to increase the number of qualified U.S. citizens who are undertaking advanced graduate training in disciplines directly related to water resources. This is particularly important given the uncertain future of the role of foreign graduate students coming to this country and much less their role in carrying out this needed research. An opportunity exists to develop effective means to provide major financial support to qualified U.S. citizens to undertake and complete advanced graduate training in appropriate water resource fields without carrying large debt when their studies are completed. Each university needs to address and resolve the issue of undertaking this critical research to protect water infrastructure and yet provide means to ensure that the results of the research effort do not reach those who would use the results to do harm. Each university needs to consider how to address and resolve the issue of free exchange of information among and between key researchers versus whether or not terrorists can take advantage of this system of open exchange of information. It is essential to examine the implications of restricting the free exchange of information and thus limit terrorist access but also potentially limiting access to other researchers and thus limiting progress.

## REFERENCES

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