

**2008 Meeting
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Item 6 of the provisional agenda

**Consideration of oversight, education,
awareness raising, and adoption and/or
development of codes of conduct with the
aim of preventing misuse in the context
of advances in bio-science and bio-technology
research with the potential of use for
purposes prohibited by the Convention**

OUTREACH AND EDUCATION IN THE LIFE SCIENCES: CASE STUDY IN THE U.S. DEPARTMENT OF ENERGY NATIONAL LABORATORIES

Submitted by the United States of America

I. Introduction

1. Article IV of the Biological Weapons Convention (BWC) requires states to hold their citizens responsible for violating the BWC, thus supporting the concept of individual responsibility. Upholding the “intent” of the Biological Weapons Convention (BWC) in part rests on the expertise, judgment and goodwill of individual scientists. The nature of life sciences research means that individuals are often unaware of the dual-use concerns related to biological research. Outreach and education are among the most effective tools for promoting responsible research and enhancing biosafety and biosecurity.

2. As part of the U.S. effort to address obligations under the BWC, the Department of Energy (DOE) and National Nuclear Security Administration (NNSA)¹ has been pursuing a unique outreach and education program in their national laboratories that is designed to familiarize more than 30,000 scientists and engineers with the BWC. The program began in 2005

¹ NNSA was established by Congress in 2000 as a separately organized agency within the U.S. Department of Energy. Two core NNSA missions are to reduce global danger from weapons of mass destruction and to support U.S. leadership in science and technology.

with a workshop that brought together members of the scientific community, government representatives, and private industry to discuss concerns surrounding “dual-use” research and how to foster a sustainable culture of bio-responsibility.

3. Workshop findings resulted in a series of pilot outreach and education workshops at ten DOE/NNSA national laboratories which reached out to scientists in order to increase awareness of these important issues. The topics in these workshops were designed to introduce scientists to the BWC, discuss the risks associated with dual-use research, promote communication with and among scientists, and educate scientists regarding their responsibility for safety and security. The initial workshops were designed as “train-the-trainer” events that would introduce key concepts and stimulate further discussion among key scientists and managers.

4. Following the initial workshop series, DOE/NNSA conducted a series of evaluations designed to measure the effectiveness of the program, and to gauge participants’ retention of key concepts and lessons, awareness of BWC and dual-use topics, and attitudes toward individual responsibility. The assessments were also used to help identify needs and effective mechanisms for future educational activities.

II. Evaluation methodology: survey and focus groups

5. Feedback was gathered through a confidential, web-based survey and via focus groups. The survey was made available to all workshop participants, as well as a number of scientists who did not participate in the initial workshop. The survey included 35 questions and took approximately 20 minutes to complete. .

6. For the focus groups, an interview protocol was developed to improve understanding of key issues. Separate groups were established for managers, scientists, and representatives of Institutional Biosafety Committees² (IBCs) in order to evaluate where there was consensus and difference within each functional group. There were five participants in each focus group, with a total of eight laboratories participating. In addition, comments provided by individuals who were not available to attend the IBC focus group were integrated into the analysis.

III. Results

7. Findings of the survey and focus groups are described in the paragraphs that follow in this section. The findings describe:

- (i) the perceived level of awareness and perceived need for increased awareness and/or training;
- (ii) questions and concerns raised by participants regarding dual-use guidelines, education and awareness training, on codes of conduct; and
- (iii) recommendations for the format and delivery of training materials.

² Note: This group was also open to representatives of Institutional Review Boards (IRBs), and IACUCs (Institutional Animal Care and Use Committee).

8. The current level of awareness varies among individuals in different areas of the life sciences. Individuals working with select agents or pathogens were generally found to have a higher level of awareness of the risks of dual-use, while individuals in other disciplines or working at lower levels of biosafety (i.e., BSL2 and below) were generally aware of the potential for dual use or misuse of research, but were not driven by dual-use considerations in planning and conducting their own work.

9. While participants acknowledged the risks in almost all types of life science research, they noted that disciplines outside experimental biology also have the potential for dual-use risk as well³. Participants indicated that there is a need to consider dual-use potential across these disciplines, as well as within the classical life sciences.

10. It is difficult to objectively quantify the dual-use risk of an experiment or project. Scientists would benefit from 1) increased awareness of dual-use issues, and 2) simple tools and guidelines that could help in an objective assessment of risk. Lack of clear and effective guidelines puts a heavy burden on those who are responsible for evaluating projects, proposals and reports for dual-use potential.

11. Scientists currently rely on the expertise of a few individuals⁴ to determine the potential for dual-use risk which increases the challenge of managing dual-use research. There was strong consensus that increased awareness for IBC reviewers, project managers, and scientists would be useful. Other groups benefiting from awareness and education would include: students and interns, security officers/reviewers, laboratory technicians, and the public.

12. Most scientists feel a moral obligation to do “no harm,” and conduct research with the best of intentions. In general, scientists expressed that enforceable guidelines will serve to constrain scientific research without significantly improving biosecurity. There was concern that security oversight could morph into censorship; implementing additional legislation and regulation would hamper scientific progress. Focus group participants believed that mandated guidelines and codes of conduct related to dual-use and biosecurity issues in the life sciences would be overly restrictive, burdensome, and unnecessary. It was thought that voluntary standards could help contribute needed clarity in this area and help raise awareness, provided they did not evolve into regulations. Participants noted the importance of openness and transparency, indicating that restrictions on the dissemination of information would only discourage scientific research.

13. Most participants saw value in the prospect of future training in this area, and indicated that an awareness of dual-use issues and the BWC would engender a culture of security and responsibility. Participants noted that understanding of dual-use issues often varies by scientific discipline as well as by the activities of individuals. Appropriate training should be provided to the various levels of understanding, in order to raise the overall level of awareness. Specific recommendations included: providing multiple levels or “tiers” of training targeted to different levels of understanding; developing case studies and examples to help clarify what is meant by “dual-use” in the life sciences; and framing concerns about biosecurity and dual-use in the

³ Disciplines that were specifically suggested included: mathematical and physical modeling, materials science, and nanotechnology.

⁴ Primarily IBC reviewers and Authorized Derivative Classifiers (ADCs).

context of broader issues, such as infectious disease and public health to make these issues more relevant to daily research.

14. At the national laboratories, Institutional Biosafety Committees (IBCs) are currently a central point for biosafety communication, outreach and training. Whatever organization becomes a focal point for outreach and training for biosecurity and dual-use concerns would most likely require additional tools and resources, as well as support and reasonable guidance.

15. It was noted that education on dual-use topics should be provided early and continually reinforced. The long-term goal would be to develop a “culture of responsibility” that would include a shared general awareness of security concerns. Scientists thought that it would be particularly beneficial to engage young scientists as part of their education and early training, and that it would be of value to work with academic institutions and professional societies to provide training.

IV. Next Steps

16. Based on the evaluation of the previous outreach programs, DOE/NNSA will explore development of educational and training curricula and will identify best practices for low-cost, sustainable deployment of these outreach efforts within its national laboratories.
