



Society for Risk Analysis

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New Study Evaluates Methods to Prevent Importation of Illicit Nuclear Materials

Research suggests that new port security act may be insufficient

OCTOBER 15, 2006: The nightmare scenario in homeland security is a terrorist detonation of a nuclear weapon on U.S. soil. In a paper published this month in *Risk Analysis: An International Journal*, Dr. Lawrence Wein of the Standard University Graduate School of Business, along with his co-authors, discusses the costs and effectiveness of available technologies for detecting a nuclear device at a U.S. port or on a U.S.-destined ship at a foreign port. This study comes on the heels of the President signing the SAFE Port Act of 2006 into law last Friday.

Over 95% of overseas U.S. imports and exports are shipped in standardized containers that enter the country through U.S. ports. These containers represent a potentially vulnerable mechanism for the delivery of nuclear and radiological devices by foreign terrorists. The cost of a nuclear detonation at a U.S. port is estimated at about 1 trillion dollars. Terrorists may also attempt to detonate a smuggled device in a U.S. city center to maximize the loss of life.

Professor Wein and colleagues discuss an 11-layer security system to detect a smuggled device and use game theory to find the optimum combination of security measures. The authors estimate a low probability of detection with the current system of approximately 10% (before the SAFE Port Act is implemented). The authors suggest that achieving a detection rate of at least 90% would require an investment of about \$2 billion for testing at domestic ports only with an additional \$11 billion for testing done at overseas ports.

According to the study, one major limitation of the SAFE Port Act is that it only requires radiation detection. Because terrorists can shield their weapon with dense material, two-dimensional scans are also needed to detect shielding. A second major limitation of the SAFE Port Act is that it does not require inspections at overseas ports for ships destined to the

U.S., although it does provide training and loans for detection equipment for ports in other nations. Terrorists may be able to detonate a device upon arrival at a U.S. port before any attempts at detection occur. The only way to prevent this scenario is to inspect cargo at overseas ports.

Dr. Wein summarized his research by noting “the estimated \$10 billion/year required to secure ports is comparable to the current annual investment for ballistic missile defense, making this a sound investment in light of the shift in the nature of the threat from adversarial nations to terrorists.”

A copy of the full article “Preventing the Importation of Illicit Nuclear Materials in Shipping Containers” is available from the Managing Editor of *Risk Analysis*, Dr. Rick Reiss, at rreiss@exponent.com.

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