

APR05-2005-000500

Abstract for an Invited Paper
for the APR05 Meeting of
the American Physical Society

Technical approaches to reducing the threat of nuclear terrorism

WILLIAM C. PRIEDHORSKY, International, Space, and Response Division, Los Alamos National Laboratory

The threat of a nuclear attack on the United States by terrorists using a smuggled weapon is now considered more likely than an attack by a nuclear-armed ballistic missile. Consequently it is important to understand what can be done to detect and intercept a nuclear weapon being smuggled into the United States. A significant quantity of smuggled nuclear material has been intercepted already, but science and technology have so far contributed little to its interception. The critical special nuclear materials, plutonium and highly enriched uranium, are only weakly radioactive and detection of their radioactivity is limited both by atmospheric attenuation and by competition with natural backgrounds. Although many schemes for long-range detection of radioactivity have been proposed, none so far appears feasible. Detection of nuclear radiation can be improved using new technologies and sensing systems, but it will still be possible only at relatively small distances. Consequently the best approach to containing dangerous nuclear materials is at their sources; containment within lengthy borders and large areas is extremely difficult.