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Nuclear Forensics: Report of the AAAS/APS Working Group

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This report was produced by a Working Group of the American Physical Society's Program on Public Affairs in conjunction with the American Association for the Advancement of Science Center for Science, Technology and Security Policy. The primary purpose of this report is to provide the Congress, U.S. government agencies and other institutions involved in nuclear forensics with a clear unclassified statement of the state of the art of nuclear forensics; an assessment of its potential for preventing and identifying unattributed nuclear attacks; and identification of the policies, resources and human talent to fulfill that potential. In the course of its work, the Working Group observed that nuclear forensics was an essential part of the overall nuclear attribution process, which aims at identifying the origin of unidentified nuclear weapon material and, in the event, an unidentified nuclear explosion. A credible nuclear attribution capability and in particular nuclear forensics capability could deter essential participants in the chain of actors needed to smuggle nuclear weapon material or carry out a nuclear terrorist act and could also encourage states to better secure such materials and weapons. The Working Group also noted that nuclear forensics result would take some time to obtain and that neither internal coordination, nor international arrangements, nor the state of qualified personnel and needed equipment were currently enough to minimize the time needed to reach reliable results in an emergency such as would be caused by a nuclear detonation or the intercept of a weapon-size quantity of material. The Working Group assesses international cooperation to be crucial for forensics to work, since the material would likely come from inadequately documented foreign sources. In addition, international participation, if properly managed, could enhance the credibility of the deterrent effect of attribution. Finally the Working Group notes that the U.S. forensics capability involved a number of agencies and other groups that would have to cooperate rapidly in an emergency and that suitable exercises to ensure such cooperation were needed.