



# The IAEA and Nuclear Security: Trends and Prospects

December 2010

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While it has been a concern from the beginning of the nuclear age, nuclear security has recently catapulted to the top of the international security agenda. Three spectacular events catalyzed this priority: (1) the collapse of the Soviet Union and the ensuing revelations about "loose nukes"; (2) the terrorist attacks on September 11, 2001, and the specter of nonstate actors who will stop at nothing to achieve their goals, including the use of nuclear materials and weapons; and (3) the exposure of a secret international nuclear supply network that facilitated the ease with which nuclear technology could be illicitly acquired.

Interest in developing nuclear power capabilities has expanded and heightened the potential for malicious use of nuclear and radioactive materials. An increase in the number of new national nuclear power programs will likely include the construction of a variety of nuclear facilities that could be rich new targets of opportunity for terrorists and other dangerous actors.<sup>1</sup> Although a nuclear attack has not yet occurred, there is evidence that nonstate actors may be seeking to

develop, acquire, and use chemical, biological, radiological, and nuclear weapons.<sup>2</sup> In 2009, an international conference on nuclear security noted credible evidence that criminal organizations are interested in acquiring and using nuclear material to build a rudimentary nuclear explosive device, and in constructing a radiological dispersal device that could be used to sabotage nuclear facilities or places where radioactive substances are used, stored, or transported.<sup>3</sup>

Terrorists and other criminals might try to acquire nuclear weapons through bribes, extortion, or theft. They are attempting to acquire nuclear and other radioactive materials, expertise, manufacturing capabilities, and the technical skills needed to build an improvised nuclear device.<sup>4</sup> In a September 2008 statement, former International Atomic Energy Agency (IAEA) Director General Mohamed ElBaradei stressed that, "the number of incidents [illicit trafficking] reported to the agency indicates ongoing weaknesses and vulnerabilities."<sup>5</sup> An increase in the theft and smuggling of dangerous materials means that terrorists are likely to be

able to develop weapons such as a dirty bomb sooner rather than later. Terrorists with the right resources, intent, and tenacity could conceivably develop an improvised nuclear device.

Despite this growing danger, standards for preventing, detecting, and responding to threats emanating from security lapses are absent, and efforts to remediate this gap have been piecemeal and spotty. National capabilities for strengthening nuclear security are uneven and the political will for making those improvements is unequally shared. Some countries have noted conflicts between their national nuclear security regulations and the IAEA's recommendations. States are confused about what regulations and recommendations pertain to their facilities. The nuclear industry is also concerned over the level of security that is necessary at its facilities. If too much security is required, financial burdens increase. If lax security leads to loss or theft of nuclear materials, enthusiasm for nuclear power will ebb. High-level security measures also create inefficiencies in industrial processes and some safety measures already create more work than is necessary.<sup>6</sup>

### **No International Coordinating Body**

Nuclear security is understood to be the responsibility of individual states, and yet some of the most significant threats to their security are transnational and international. Nuclear security has evolved into a global problem, but a coordinated global response has been weak and inadequate. There is now a plethora of overlapping national, bilateral, and multilateral tools, including creative international instruments—some legally binding, others purely voluntary—to deal with the burgeoning problems of nuclear security and terrorist threats.

The Nuclear Security Summit (NSS), convened in Washington, DC, in April 2010, did gain agreement among 47 states and 3 international organizations, including the IAEA, on the urgency of the nuclear security danger and on a work plan of action items—both monumental achievements. It also gave testimony to the accelerating need to take collaborative international action. Yet, there is no single coordinating body to help make those goals possible, apart from ad hoc efforts such as the NSS and the various national and international instruments alluded to above. Greater coordination, direction, and clarity of the task ahead are needed. Because of its established track record and

programs already in practice, together with its independence, integrity, and confidentiality, the IAEA is best suited to assume that leadership role. Making that a reality, however, will not be easy.

### **Genesis of IAEA Involvement in Nuclear Security**

Even while the final negotiations for the Nuclear Non-Proliferation Treaty (NPT) were underway, there was a growing need for protecting nuclear materials and facilities.<sup>7</sup> In the early 1970s, the IAEA became involved in nuclear security efforts. The IAEA director general convened a panel of experts to consider ways to secure nuclear material and facilities. Three years later, the agency issued its “Recommendations for the Physical Protection of Nuclear Material” in an information circular (INFCIRC/225).<sup>8</sup> This document is now in its fourth revision.

Recognizing the growing need for cooperation among states to ensure adequate physical protection of potentially hazardous material, the director general circulated a draft, “Convention on Physical Protection of Nuclear Facilities, Material and Transports” to IAEA member states. After two years of negotiations, 16 member states gathered to consider the preparation of a Convention on the Physical Protection of Nuclear Material (CPPNM). On October 26, 1979, the convention was adopted and it entered into force on February 8, 1987. The convention remains the only legally binding instrument with specific provisions for the protection of nuclear materials.<sup>9</sup>

In 1997, following reports of illicit trafficking of nuclear and other radioactive material, the agency established the Security of Material Programme, and in 2002, after the devastating events of September 11, 2001, the agency created the Office of Nuclear Security (NSNS) under the Department of Nuclear Safety and Security.<sup>10</sup> NSNS is responsible for coordinating activities under the IAEA's Nuclear Security Plan (NSP)—a set of initiatives developed to help countries meet their international obligations to develop and implement an effective nuclear security program.<sup>11</sup> In March 2001, the agency created the Code of Conduct on the Safety and Security of Radioactive Sources. This nonbinding instrument seeks to harmonize and implement national laws and regulations to prevent unauthorized uses of radiological sources and to minimize the radiological consequences of accidental or malicious acts.

## Components and Activities of the IAEA Office of Nuclear Security

The NSNS implements activities within the NSP—the plan now in its third multiyear edition (2010-2013). It has four activity areas: (1) needs assessment, information collation, and analysis; (2) the enhancement of a global nuclear security framework; (3) the provision of nuclear security services; and (4) risk reduction and security improvement. Within these activity areas, the IAEA focuses on promoting and facilitating adherence to international instruments, developing international guidelines and recommendations, providing evaluation and advisory services, education and training, offering technical improvements and upgrades, and coordinating and sharing relevant information and activities among member states. Specific IAEA services include:

- **International Nuclear Security Advisory Service** sends missions to requesting states to assess their legislative and regulatory systems, physical protection, human resource development, and detection and response capabilities in the event of illicit trafficking.
- **International Physical Protection Advisory Service (IPPAS)** sends missions to assess a requesting state's system of physical protection on a national and facility level. IPPAS assessments involve comparisons between a requesting state's physical protection system and INFCIRC/225/Rev.4 guidelines.
- **International SSAC Advisory Service** sends missions to assess a requesting state's system for accountancy and control (SSAC).
- **International Team of Experts Advisory Service** organizes international teams of technical, legal, and policy experts to advise states on their adherence to and implementation of international legal instruments to enhance protection against nuclear terrorism.
- **Integrated Regulatory Review Service** reviews a state's national regulatory bodies and its implementation of national safety and security legislation and regulations.<sup>12</sup>
- **Radiation Safety and Security of Radioactive Sources Appraisal** advisory missions review a state's national regulatory infrastructures for radiation safety and security of radioactive sources.
- **Emergency Preparedness Review** missions review the host state's preparedness to deal with nuclear or radiological emergencies.<sup>13</sup>
- **Coordinated Research Projects** improve physical detection and response capabilities.
- **HEU Fuel Takeback and Return Services** provide assistance to member states to remove or reduce inventories of high-risk material, including HEU fuel.<sup>14</sup>
- **Human Resource Development Services** provide training courses, seminars, and workshops at the national, regional, or international level for operators, SSAC administrators, and IT staff. NSNS also provides training on the detection of and response to illicit trafficking, and particularly in the proper use of detection equipment.
- **Nuclear Security Equipment Laboratory (NSEL)** coordinates the procurement and delivery of radiation detection equipment to states. The NSEL is just one of a network of analytical laboratories run within member states to perform similar functions.
- **Incident and Emergency Centre (IEC)** is the principal source for preparedness, communication, and response to radiological emergencies. The IEC provides 24-hour service to help member states manage nuclear and radiological incidents.
- **Security for major public events.** States receive help in developing the means to implement nuclear security at major public events, including training and equipment procurement assistance.<sup>15</sup>
- **Border Monitoring Working Group** is a forum for the discussion and sharing of information on the implementation of detection monitoring activities at strategic locations within states.
- **Draft recommendations and guidance documents.** Various guidance documents and directives are drafted that help states develop and implement nuclear security programs.
- **Illicit Trafficking Database (ITDB)** is the IAEA's information system on incidents of illicit trafficking and other unauthorized activities involving nuclear and radioactive materials. NSNS

manages the collection, recording, and sharing of this information. In it are incidents that focus on unauthorized acquisition, provision, possession, use, transfer, movement/trade, or disposal of materials, as well as failed or thwarted acts. The IAEA conducts analyses of incident data to determine the nature and severity of illicit trafficking in particular regions.

- ***Integrated Nuclear Security Support Program*** is a new program that coordinates and integrates IAEA nuclear security support efforts with those of other donors and member states with the goal of promoting long-term sustainability and more effective planning.

### IAEA Cooperation With the International Community

IAEA representatives have provided advice to enhance security at major international events, participated in or attended G-8 summits and United Nations Security Council Resolution 1540 (UNSCR 1540) reviews, and are involved with many other international fora invested in nuclear security. It has formal agreements with more than 70 intergovernmental and nongovernmental organizations around the world.

The agency played a visible role in the April 2010 NSS by providing critical input to the final Communiqué and Work Plan and by agreeing in principle to expand its role. Participating states at the NSS declared strong support for IAEA activities and some pledged additional monetary contributions, specifically promising to contribute more funds to the Nuclear Security Fund (NSF), to improve nuclear smuggling outreach, and to help implement the agency's nuclear security agenda. The NSS Work Plan highlighted a prominent role for the IAEA in nuclear security. Along with welcoming the IAEA's role in advancing new technologies for nuclear security and materials accountancy, action steps called upon all participating states to cooperate with the IAEA in "the prevention and detection of, and response to, theft, sabotage, unauthorized access and illegal transfer, or other malicious acts involving, inter alia, nuclear material, and associated facilities, and is providing guidance in developing and implementing effective nuclear security measures."<sup>16</sup>

The IAEA works to assist states in implementing their obligations under UNSCR 1540. The reso-

lution is one of the few binding instruments to impose nuclear security obligations on all states. It requires all states to adopt and enforce "appropriate effective measures" to prohibit any non-state actor from manufacturing, acquiring, possessing, developing, transferring, or using nuclear, chemical, or biological weapons, and to establish domestic controls to prevent the proliferation of weapons of mass destruction. The 1540 Committee, a small administrative group within the Security Council, uses outside experts to focus on capacity building and to provide nuclear security assistance to states that need it.<sup>17</sup> The committee has already enlisted the IAEA's support in considering the adequacy of reports submitted by states on their adherence to UNSCR 1540 obligations.<sup>18</sup>

### IAEA Nuclear Security Strengths

With more than 150 member states, the IAEA nuclear security programs can reach most of the world's nuclear materials and facilities. As with nuclear safeguards, the legitimacy of the agency's nuclear security effort is sustained by its expertise, experience, transparency, and confidentiality. Its experts offer critical assistance to states on the implementation of national nuclear security measures.<sup>19</sup> The IAEA's commitment to transparency and confidentiality positively influences a state's willingness to participate in the agency's nuclear security programs. The extension of the safeguards confidentiality standard to the nuclear security program increases the willingness of member states and the nuclear industry to disclose information on national security, facility makeup, and proprietary commercial information.

The IAEA reaches out to member states, as well as regional and other international bodies, to coordinate nuclear security efforts. The NSP has enabled greater coordination in the international community and gives a clear understanding of nuclear security-related work under the IAEA.<sup>20</sup> The NSNS has begun to take advantage of the synergies between safety, security, and safeguards, dubbed the "3 Ss", to carry out activities under the plan, particularly with regard to the development of new technologies.<sup>21</sup>

The agency continues to update and improve the NSP based on an evolving global environment. Periodic revisions have taken into account the transition from a bipolar to multipolar world order, substructure security threats, threats ema-

nating from low-density and regional conflicts, and national and/or subnational entities. The Integrated Nuclear Security Support Program coordinates IAEA efforts with those of other donors to avoid start-and-stop programming and to promote long-term, sustainable security-related efforts in member states.

The success of IAEA advisory missions has prompted more interest on the part of member states in the agency's nuclear security program.<sup>22</sup> The number of requests for advisory and evaluation services has been increasing annually. Training and education programs are widely sought after and have helped thousands of practitioners around the world.<sup>23</sup>

The IAEA's nuclear security activities have raised awareness of the potential threats, including the terrorist threat, and the need for an active approach to nuclear security.<sup>24</sup> This has led to a growing number of member states reporting initial illicit activities and providing follow-ups on trafficking incidents. Since July 2009, three new states have joined the ITDB programme. From that time through June 2010, 222 incidents were reported to the ITDB.<sup>25</sup> The agency enters these reports into its database which provides insights into illicit trafficking problems at any given time. In response to increased requests by states for more updated, complete, and reliable information on illicit trafficking, a new ITDB software platform has been developed to enable better data management and to collect and collate information on both trafficking as well as other nuclear security-related incidents.<sup>26</sup>

The agency's nuclear security research and development (R&D) efforts have resulted in concrete improvements in detection methodology and equipment capabilities. For instance, the agency has developed a mobile hot cell for the purpose of recovering, handling, and conditioning spent high-activity radioactive sources.

The agency has developed a rapid 24-hour response capability to remediate nuclear and radiological incidents and emergencies through its Incident Emergency Centre (IEC). Working with member states and other organizations, the IEC assists member states in better preparing for and reporting on such incidents and helps coordinate international responses to them.

Similarly, the agency contributes significantly to the development and enhancement of international legal instruments. As a result, numerous states have enacted new criminal laws on nuclear theft and smuggling that have increased their defense against terrorist activities.<sup>27</sup> Some important NSNS legal contributions include working with the International Convention for the Suppression of Acts of Nuclear Terrorism and the Amendment to the CPPNM (both of which require parties to criminalize nuclear theft and smuggling), and the legal requirements of UNSCR 1540.<sup>28</sup> The CPPNM Amendment has an expanded scope including the domestic storage, protection, and transport of nuclear materials and facilities, but it has yet to enter into force.

### IAEA Nuclear Security Limitations

The agency has no standing authority to require states to establish nuclear security systems within their borders, nor does it have the authority to verify the physical protection of nuclear materials in states. IAEA guidance is only provided upon request.<sup>29</sup> The general recommendations that are published as INFCIRC 225/Rev. 4 are widely recognized as a guide, but are not mandatory.<sup>30</sup> There is no nuclear security mandate similar to the safeguards mandate to ensure that states adequately protect their nuclear materials.<sup>31</sup> Under the safeguards agreements, the IAEA does not have the authority to comment on or take action on the measures a state applies for physical protection.<sup>32</sup> Even if safeguards inspectors noted nuclear security inadequacies, they would not legally be able to report them.

According to experts, IAEA guidance documents, although considered the closest attempt at a working standard, are still insufficient for tackling modern threats and are generally outdated. It is possible for a nuclear facility to be in compliance with IAEA recommendations and still have inadequate nuclear security arrangements.<sup>33</sup> INFCIRC/225 recommended standards were not designed to protect against terrorists with the resources, skills, and training similar to those who carried out the 9/11 attacks.<sup>34</sup> While these recommendations are more specific than the amended CCPNM, they are still very vague.

Because it can only act on the basis of requests from states, the agency has not been able to establish a baseline global nuclear security standard. In the absence of such a baseline, the

agency has only carried out limited evaluation of the effectiveness of its services. To date, the agency has not developed a satisfactory approach to measuring the real effectiveness of its services (i.e., determining how the risk of particular types of nuclear terrorism have been reduced through NSNS assistance).<sup>35</sup> Consequently, the agency's progress reports to its Board of Governors (BOG) do not provide sufficient judgment on the effectiveness of IAEA nuclear security activities.<sup>36</sup>

The NSNS relies almost exclusively on extra-budgetary contributions to the NSF. Roughly 90 percent of the funding for the NSP comes from voluntary funding.<sup>37</sup> Under the current system of voluntary contributions there is an inherent unpredictability and inconsistency between the amount of funding that is pledged and the amount that is actually received. Additionally, there is a large and uncertain gap in the time that funds are pledged and the time they are provided to the agency.<sup>38</sup> The unpredictability of shifting exchange rates and of unanticipated demands further complicates planning. Moreover, IAEA financial regulations prevent it from making expenditures based on pledges. Consequently, the long-term planning and implementation of nuclear security activities are difficult and less effective than they would otherwise be.<sup>39</sup>

Limitations on the uses of voluntary funds have created difficulties in the implementation of the NSP.<sup>40</sup> Most donors place conditions—the functional equivalent of earmarks—on the use of the funds they donate, although many states attempt to find some balance between their desires and those of the IAEA in the use of their funds. Nonetheless, the agency is forced to allocate funds based on the desires of the donor state, and does not have the latitude to shift resources to meet program needs as they see them.<sup>41</sup> The United States is the largest annual contributor to the IAEA voluntary account and partitions its funds among several priority areas, with less than ten percent of its annual allocation in 2009 allotted to the Nuclear Security Fund. The largest share of the US contribution is allocated to support technical cooperation programs and nuclear safeguards and verification.

Increasing the IAEA assessed budget has always been an unwelcome and largely unsuccessful endeavor over the years. Efforts by the United States and several other states to increase the reg-

ular budget to keep pace with mounting requirements over the past two decades have almost always been rebuffed, leaving the agency with de facto “unfunded mandates” where many actions are asked of them, but without providing the resources to carry them out. Attempts in recent budget deliberations to include modest funding for nuclear security in the regular budget—an amount that would be added to funding from voluntary contributions—have been resisted by those states wishing to avoid increasing their assessed obligations, or by those who believe that any additional funding ought to be assigned to other priorities.

Slightly less than \$1.5 million was included in the regular assessed budgets for nuclear security activities in 2008 and in 2009. The amount approved for 2010 increased to about \$4 million and slightly more has been requested for 2011. When regular budget funds are combined with voluntary donations and unexpended funds carried over from previous years, annual funding available for all nuclear security activities around the world in 2009 amounted to roughly \$36.7 million. Clearly, there is a mismatch between the resources that are needed and those that are available to manage a robust and credible nuclear security program at the international level.

Failure to close this resource gap with additional funding makes it difficult for the agency to keep pace with the growing security requirements asked of it and to meet the hefty requirements expected of it during the NSS. Enthusiasm and goodwill toward securing nuclear materials and radiological sources, evidenced by pledges of additional funds by several participating states at the NSS, may translate into more resources and greater flexibility by member states in future IAEA budget decisions.

## Putting IAEA Nuclear Security Center Stage

A number of initiatives, if adopted, could put the IAEA at the center of international nuclear security. Many, but not all, of these initiatives will require additional funding and, in some cases, new authorities.

**Develop Comprehensive Standards.** The IAEA should work with the international community to develop a comprehensive set of legally binding standards based on INFCIRC/225/Rev. 4 (Corrected),

the amendment to the CPPNM, and other nuclear security commitments such as UNSCR 1540 and the International Convention for the Suppression of Acts of Nuclear Terrorism.<sup>42</sup> The agency should help to better define and enumerate states' nuclear security requirements.<sup>43</sup> It should also consider developing an INFCIRC devoted to the protection of nonnuclear radioactive sources.<sup>44</sup> It should also seek the necessary authority to monitor, report, and verify implementation of these standards.

**Ratify CPPNM Amendment.** The IAEA should intensify its efforts to reach the required ratification by two-thirds of member states to bring the amendment into force. Currently, fewer than half of the required two-thirds have ratified the amendment. Ratification would greatly enhance the IAEA authority and scope in protecting domestic use, storage, and transport of nuclear materials.

**Help Implement UNSCR 1540.** In general, the IAEA should work more closely with other public and private organizations invested with nuclear security responsibilities to advance shared objectives. The Office of Nuclear Security should coordinate or partner with the 1540 Committee to meet common nuclear security goals and should request additional resources to help countries meet their obligations under UNSCR 1540.<sup>45</sup> The IAEA has significantly more on-the-ground experience and is well placed to assume certain nuclear security obligations of the 1540 Committee. The two organizations could work together more closely to identify and prioritize activities relating to the development of greater nuclear security infrastructures within member states.<sup>46</sup>

**Increase the Role of Safeguard Inspectors.** The agency should consider whether IAEA inspectors could be trained and tasked with routine checking and reporting on the adequacy of physical protection at nuclear facilities.<sup>47</sup> Short of burdening safeguards inspectors with additional tasks, the IAEA could consider pairing nuclear security specialists with safeguard inspectors when they visit nuclear facilities. A strengthened relationship between the IAEA and the UN Security Council could improve enforcement of UNSCR 1540 and other measures.<sup>48</sup>

**Improve Safety, Security, and Safeguards Integration.** The agency should continue to integrate the 3Ss concepts. More consideration

should be given to finding the best method of synergizing activities such as information sharing, closer development of standards and regulations, and developing safe and secure technologies. The IAEA should appoint a working group of representatives of the relevant offices to harmonize safety and security guidelines. The group should review and crosscheck safety and security guidance documents to ensure that they do not overlap or conflict, and so that they provide the maximum protection for both purposes.<sup>49</sup> Guidelines should also be crosschecked or developed in tandem so that they are thorough and clear.

**Implement Mandatory Threat Assessments.** As it initiates cooperation and offers assistance to member states, the IAEA should start with an initial threat assessment. Assessments should be conducted for each agreement between the IAEA and the state party. Currently, as a part of any technical cooperation project, the agency obliges member states to take all measures necessary for the physical protection of nuclear material, equipment, and materials relating directly to the assistance provided by or through the IAEA.<sup>50</sup> The IAEA could institute the use of a Design Basis Threat (DBT) based on a sliding scale of threat levels. The higher the threat, the more stringent the standards and procedures for security should be. The IAEA should investigate the potential usefulness of developing an alternative to the state model of a DBT. Unique regional circumstances may create enough similarities to warrant a regional approach to a DBT methodology, and perhaps even interconnected systems of physical security.<sup>51</sup>

**Develop Sustainability.** The IAEA should institute mandatory follow-up missions for all its services to review and verify that states successfully implement recommended activities. If states neglect to implement recommendations, these findings should be reported to the BOG. Similarly, agency safeguards inspectors should be given a physical protection reporting responsibility as part of their verification activities. Inspectors could provide an assessment of the security condition of nuclear facilities and report this to NSNS.

**Increase R&D.** The IAEA should continue R&D on sabotage-resistant designs for nuclear power reactors, and encourage design and utilization of research reactors that provide good physical

protection of materials.<sup>52</sup> By continuing R&D on proliferation-resistant technology, the IAEA can find new ways to integrate safeguards, safety, and security requirements.

The agency should continue to develop innovative ways to utilize information technologies for nuclear forensics. The IAEA safeguards regime enables it to take environmental samples in all facilities and locations to verify activities, and the agency maintains a database on sample results of nuclear fuel cycle facilities. Advances in nuclear forensics have made it an indispensable technology for the IAEA. Agency databases could be expanded to cover forensics data and be used for nuclear security purposes for all safeguarded material. This information could be the foundation of an IAEA international radioactive material tracking center.

**Develop Radioactive Source Accounting.** The IAEA should establish and maintain a legal and regulatory framework for the registration, administration, and control of radioactive sources.<sup>53</sup> A tracking system and source signature database could be developed under the auspices of the IAEA, under national SSACs, or as an independent international registry. The agency should consider options similar to the US National Source Tracking System under the Nuclear Regulatory Commission.

**Strengthen Export Controls.** The agency should help states develop rigorous export controls.<sup>54</sup> Specifically, it could consider offering to help supplier states develop more stringent requirements for nuclear security measures. Some nuclear supplier states have asked buyers to institute measures of physical protection like fences or walls before receiving materials. However, requirements vary widely from country to country and would benefit from some consistency. The IAEA should encourage the Nuclear Suppliers Group (NSG) to better define the level of standards it requires before sensitive technologies are transferred instead of leaving it to the supplier and recipient state.

**Certification Program.** The agency should develop a nuclear security certification program for individual facilities. The NSG and supplier states could use the certification as a baseline requirement or condition (along with safeguards) for providing assistance or for transferring materials, technology, or training. The IAEA should take advantage of

the current interest in nuclear power to incorporate nuclear security and safety principles at the earliest possible stages of development.<sup>55</sup>

**Increase Self-Evaluation.** The agency should consider developing clear and meaningful qualitative measures to evaluate the effectiveness of its NSP, if it is to keep pace with the changing nuclear environment. It might consider identifying performance-based measures, such as the percentage of facilities assessed by the IAEA that have adequate security arrangements.<sup>56</sup> The system should include an evaluation of personnel practices to determine resource requirements over the long term.<sup>57</sup>

**Seek More Flexible Resources.** The IAEA should continue to seek more voluntary contributions to the Nuclear Security Fund and increase efforts to include more funds for nuclear security programs in the regular budget. It should also consider creating a Nuclear Security Contingency Fund that would be fenced off and set aside for unanticipated nuclear security and emergency needs, designed for quick disbursement, and available at the discretion of the director general who would report any drawdowns from the fund to the BOG.

Progress in these initiatives will only be possible with the cooperation and support of member states, many of whom do not regard nuclear security as a priority. At the moment, the IAEA lacks a mandate or “buy-in” from its member states to expand and strengthen its nuclear security activities, thereby making progress on these initiatives difficult, but not impossible, to achieve. Success will require, at minimum, that the IAEA solicit the active help from willing member states and from nongovernmental organizations who share similar concerns.

## Summary and Conclusions

Nuclear security has become a top international security priority over the past two decades due to the fear that terrorists or other groups might acquire nuclear materials and weapons. In response, the international community has developed a diverse patchwork of initiatives that, when combined, constitute an awkward architecture of prevention, detection, and response. It is a piecemeal architecture that at best could be considered a work in progress.

Clearly, what is needed is an international agreement on minimally accepted standards and the

means to ensure compliance. In addition, better international coordination, monitoring, reporting, and sharing of information and best practices among states and the private sector about nuclear security practices could contribute to substantial progress in keeping nuclear materials and weapons out of the hands of those who are bent on using them for malevolent purposes. Additionally, a defined level of nuclear security should be made a prior condition for nuclear supply. No single global mechanism or international organization is now vested with nuclear security coordinating functions. However, the International Atomic Energy Agency is best positioned to fill that role.

The IAEA now provides valuable guidance and assistance to states to establish comprehensive national nuclear security practices for protecting nuclear and other radioactive material and for detecting and responding to nuclear security events. It collects and shares pertinent information with due regard for confidentiality and works with other international organizations and conventions such as the 1540 Committee and the CPPNM, interfaces with private nuclear industry to promote best practices, and has developed its own voluntary Code of Conduct to limit the danger of unauthorized access to, and damage from, radioactive sources. The agency provides these and other services on a shoestring budget amid conflicts amongst member states over competing priorities.

There is no doubt that the IAEA could do more to strengthen and solidify the international nuclear security regime into a defined set of principles and practices that could ensure the best possible protection against malicious nuclear acts. However, the agency lacks the authority and resources to rapidly expand and improve upon its core functions and to develop new tools and functions to fill the gaps in the nuclear security regime. It is axiomatic that the IAEA will have to grow to meet the verification, security, and safety demands that stem from a growing global economy and a marked turn toward increased use of nuclear energy and nuclear applications. The international community should not wait until the next international crisis forces improvements in nuclear security practices; it should preempt now by strengthening the role of the IAEA in its nuclear security function.

## Endnotes

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In 1973-1974, the International Atomic Energy Agency (IAEA) forecasted an installed nuclear capacity of 3,600-5,000 GW in the world by 2000, ten times what it is today. The latest example was from Hans Blix, former Director General of the IAEA, who stated two months after 3/11: "Fukushima is a bump in the road". The statement is both crass and far from today's reality. Installed capacity peaked in 2010 at 375 GWe before declining to the level of a decade ago. Nuclear electricity generation reached a maximum in 2006 with 2,660 TWh and dropped to 2,518 TWh in 2011 (down 4.3 percent compared to 2010), while the nuclear share in the world's power generation declined steadily from a historic peak of 17 percent in 1993 to about 11 percent in 2011.

Construction. December 2010. Jack Boureston Jack Boureston is managing director at FirstWatch International in Monterey, California. He specializes in nuclear security and safeguards, and illicit nuclear trade issues. Nuclear security is understood to be the responsibility of individual states, and yet some of the most significant threats to their security are transnational and international. Nuclear security has evolved into a global problem, but a coordinated global response has been weak and inadequate. There is now a plethora of overlapping national, bilateral, and multilateral tools, including creative international instruments—some legally binding, others purely voluntary—to deal with the burgeoning problems of nuclear security and terrorist threats. In the aftermath of the ruptures caused by the Iraq crisis, European states agreed in December 2003 on both a European Security Strategy and an EU Strategy against the Proliferation of Weapons of Mass Destruction (WMD). Ten years have passed since this attempt to kickstart common European policies on WMD proliferation. The IAEA and nuclear security: trends and prospects, Policy Analysis Brief, The Stanley Foundation. Dec 2010. 6. Jack Boureston. Andrew K Semmel. Jack Boureston and Andrew Semmel argue that the International Atomic Energy Agency is best suited to lead on nuclear security issues and terrorist threats. Jack Boureston and Dr. Andrew K. Semmel | December 2010. Download. Despite nuclear security having emerged at the top of the international security agenda, and even with the worldwide interest in developing nuclear power capabilities, the standards for preventing, detecting, and responding to nuclear terrorist activities remain quite poorly defined. National capabilities for strengthening nuclear security are uneven, as is the political will for making those improvements.