Sandia National Laboratories

International Security News

International Security Programs
Dori Ellis, Director

Focus on East Asia

FOCUS

East Asia, a region of critical importance to the United States economically, politically, and strategically, has a serious potential for conflict. Among the most important players in the region are China, the Korean Peninsula, Japan, Taiwan, and Russia. Some of the primary issues confronting the region today include

- The long-standing conflict between North and South Korea, in which armies of millions face each other daily across a demilitarized zone and the North defies international norms in its continued pursuit of a nuclear weapons program.

- Tensions among China, Taiwan, and the US over Taiwan's

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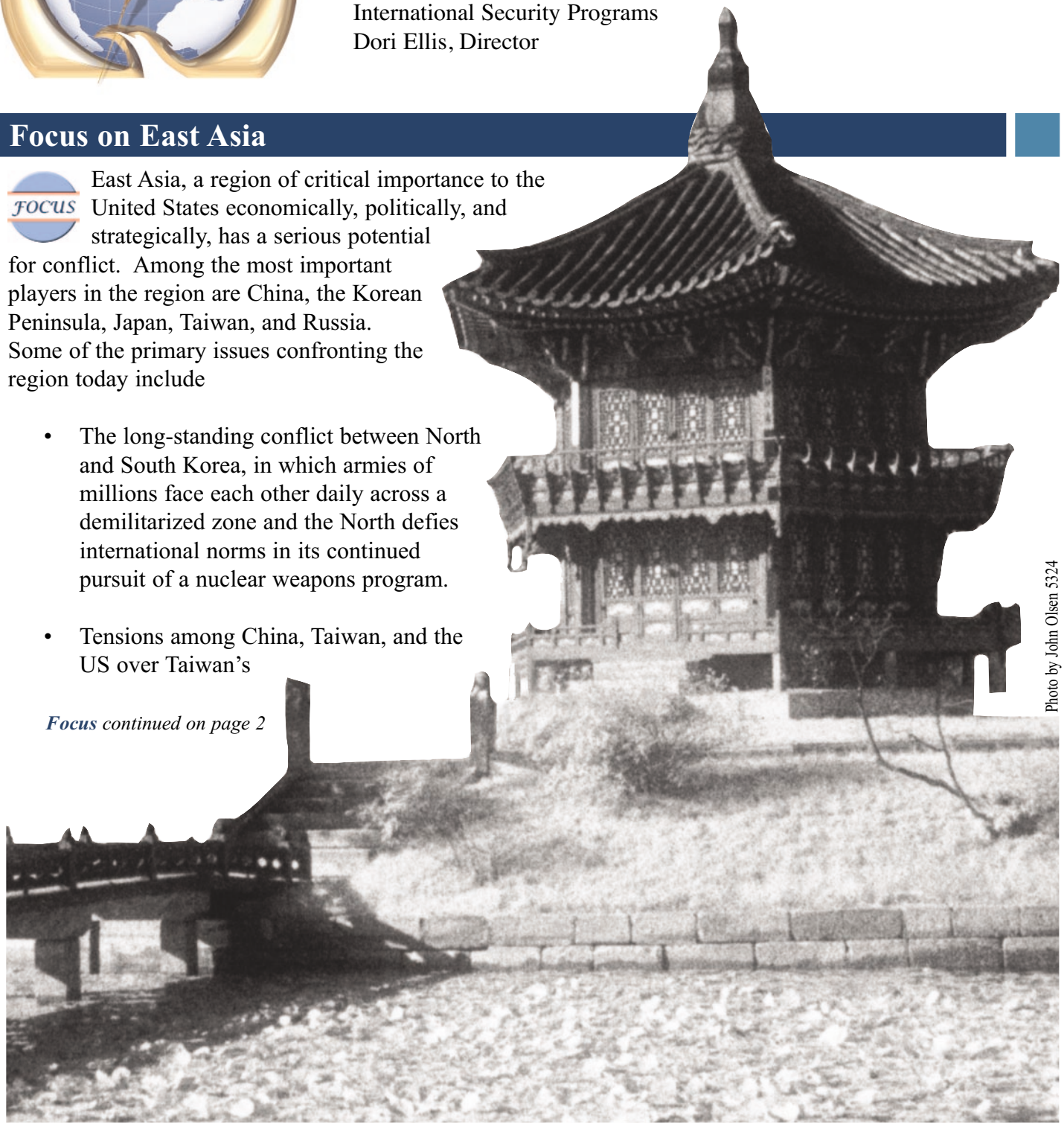

Photo by John Olsen 5324

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status, which periodically threaten to erupt into violence.

- The nature of the future strategic relationship between the US and China: How can the two countries work together bilaterally and regionally to further nonproliferation, counterterrorism, and regional stability?

- Concerns about the growth of nuclear programs in the region from both nonproliferation and safety perspectives.

Since 1996 the Regional Security Program in the International Security Center at Sandia National Laboratories has conducted numerous projects to address these issues in cooperation with regional scholars, US government experts, and nongovernmental organizations. Because these issues cannot be resolved by one country alone, the focus is on identifying ways that countries can work cooperatively to solve common problems. In particular, Regional Security Program personnel assist regional experts to identify how technology can play a role in implementing cooperative solutions. The International Security Center's Cooperative Monitoring Center (CMC) has provided the technical and logistical foundation to support these activities.

This issue of *International Security News* addresses current projects in the East Asia program and proposals for new activities in the future. A special feature is a guest article from a recent Visiting Research Scholar at the CMC. Recent activities in the region sponsored by the International Atomic Energy Agency (IAEA) and supported by Sandia staff are also noted.

Korean Peninsula CBMs Since the mid-1990s, the East Asia Program has worked with experts in the Republic of Korea (ROK)-South Korea-to analyze confidence building measures (CBMs) for the Korean Peninsula. Working together, expert personnel have addressed issues such as cooperative monitoring of the demilitarized zone, transparency measures for civilian nuclear programs, maritime CBMs, and approaches to implementation of a denuclearization agreement between the North and the South. Currently East Asia Program personnel are working with the Korea Institute for Defense Analyses (KIDA) to develop updated recommendations timed for the advent of a new administration in the ROK. These ideas could provide a framework for new discussions between the ROK and the DPRK

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(Democratic People's Republic of Korea)-North Korea.

Nuclear Transparency in the Asia Pacific The growing emphasis on nuclear energy in the Asia Pacific has led to regional concerns both about nuclear safety and about the potential for proliferation. Since 1997 the East Asia Program has worked with the Council for Security Cooperation in the Asia Pacific (CSCAP) to develop regional approaches to addressing these concerns. This effort led to development of the Nuclear Transparency in the Asia Pacific Web site <http://www.cscap.nuctrans.org>, which provides a forum for exchanging information about regional nuclear programs. A growing number of CSCAP members, including Japan, South Korea, Taiwan, Russia, and the US, have recognized the value of providing information such as levels of airborne radiation (some in real time) and virtual tours of nuclear facilities. This is a first in a region with little tradition of transparency and provides a foundation to address nonproliferation issues in the back end of the nuclear fuel cycle.

China The US has a long history of interactions with Chinese arms control and nonproliferation experts. In the mid-1990s the China Arms Control Exchange (CACE) brought together scientists from Chinese and US laboratories to discuss technical approaches to issues such as nuclear export control and nuclear material protection. The East Asia Program has worked with the growing Chinese nonproliferation community, both in the Ministry of Foreign Affairs and in universities, to provide training on technical approaches to monitoring agreements.

Since early 2001, combating terrorism has been a new program area. Because China has supported US efforts to combat terrorism, analyzing ways the US and China can work together to accomplish mutual goals is critical. Sandia's strengths in physical protection, critical infrastructure, and border monitoring may have applications in China that will help combat terrorism and at the same time help build constructive relationships between our two countries. A guest editorial by a Visiting Research Scholar from Beijing, Ms. Le Rongrong, outlines her thoughts on how we might work together.

In December 2002 China hosted an IAEA training workshop on physical security, which was attended by experts from China, India, Pakistan, South Korea, and North Korea. Physical security experts from Sandia's International Security Center and Security Systems and Technology Center conducted the workshop. Representatives from the China Atomic Energy Agency (CAEA) expressed interest in strengthening ties between the US and China on physical security. This could provide additional opportunities to work with China on the key issue of protecting nuclear material from unauthorized access by terrorists or potential proliferants.

Maritime Cooperation Many of the conflicts in the East Asia region take place in a maritime environment: confrontations between fishermen in the seas off the Korean peninsula, accidents and provocations among navies, smuggling in the Taiwan straits, piracy in the seas of Southeast Asia. Assuring the safety and security of shipping routes is critically important as growing regional economies become more dependent on Middle East oil. Recently the East Asia Program has worked with Taiwanese and Korean analysts to develop ideas for using technology to promote regional cooperation in areas such as search and rescue, vessel tracking, fisheries disputes, and antismuggling.

Other Opportunities Combining efforts with other program areas will offer other opportunities in the future. For example, China could be included in efforts to detect smuggling of nuclear materials at borders through the Department of Energy's Second Line of Defense program. Cooperative environmental monitoring at the Zvezda shipyard in the Russian Far East could alleviate regional concerns about environmental contamination associated with the dismantlement of Russian nuclear submarines. Source: Arian Pregenzer 5320, MS 1373, 505- 844-4967, fax 505-284-5055, alprege@sandia.gov

Nuclear Transparency in the Asia Pacific

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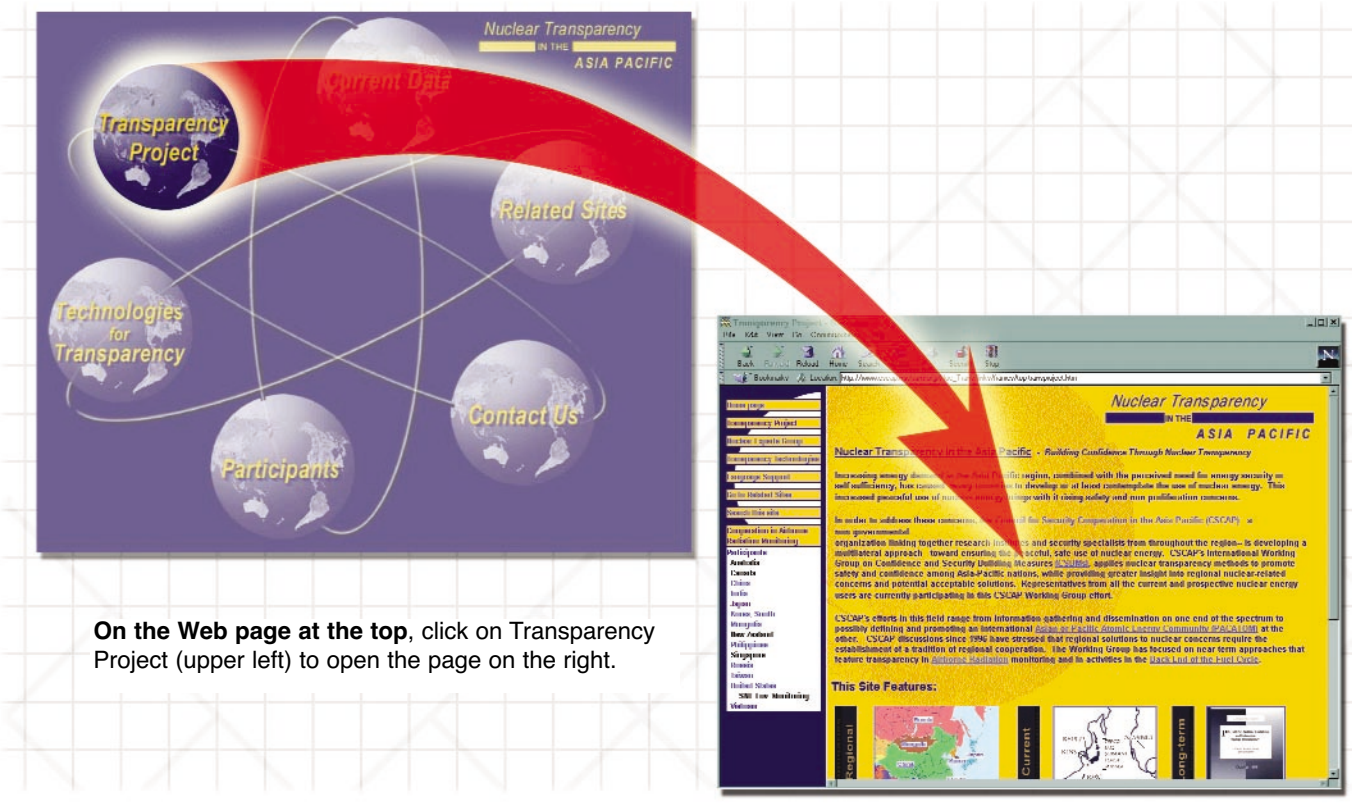
Increasing peaceful use of nuclear energy in Northeast Asia brings with it rising safety and nonproliferation concerns. The US began responding to these regional concerns in 1996, after the start of the Korean Peninsula Energy Development Organization (KEDO) project to build nuclear reactors in North Korea and in consideration of the projected acquisition of nuclear power plants in several Southeast Asia countries. Additional regional concerns were for nonproliferation related to the plutonium stockpile in Japan and safety relative to the rapid expansion of the nuclear energy industry in China. Sandia National Laboratories' monitoring and safeguards technologies offered many options for increased transparency and regional oversight to address these tensions. Through the discussion forum of the Council for Security Cooperation in the Asia Pacific (CSCAP), Sandia was able to introduce appropriate technical options into regional consideration.

CSCAP discussions of nuclear energy initially focused on institutionalized approaches to managing nuclear development, such as a PACATOM (Pacific Atomic Energy Community) somewhat molded on EURATOM (European Atomic Energy Community). Participants determined that the region first needed to cooperate on a more informal level. Consequently, CSCAP and the Cooperative Monitoring Center (CMC) convened a Nuclear Energy Experts Group to examine potential nuclear transparency measures for the Asia Pacific. The Nuclear Energy Experts Group includes nuclear industry experts from all current Asia Pacific nuclear energy producers: Canada, China, Japan, South Korea, Russia, Taiwan, and the United States. Additional participants from Singapore, Mongolia, New Zealand, and Vietnam add a broad regional perspective and prepare for expansion to new nuclear energy states in the future.

The Nuclear Transparency in the Asia Pacific Web site <http://www.cscap.nuctrans.org> is a product of this collaboration. Initially the Web site featured technologies



On the Web page at the top, click on Transparency Project (upper left) to open the page on the right.

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supporting various transparency options for regional nuclear industries. In 1999, its first year, regional partners agreed to share airborne radiation and facility safety information through the Web site. Radiation as a safety issue continues to form the backbone of the effort; however, spent fuel and waste disposition are currently being addressed for nonproliferation and material security interests.

In 1999, 2000, 2001, and 2002 the Experts Group visited institutes, industries, and organizations throughout the Asia Pacific region to promote participation in the project. Many power companies, laboratories, and nuclear authorities in Australia, Japan, South Korea, Taiwan, Russia, and the US have agreed to cooperate. Other organizations in Canada, China, the Philippines, and Mongolia have provided information for the Web site and have offered links to related Web sites. By the end of 2002, the site had grown to 3400 hyperlinks, had answered requests for 8,000 to 18,000 files per month, and had even developed some pages in Chinese, Korean, and Japanese.

Recent events of international terrorism have put pressure on regional nuclear industries to search for risk-free ways to maintain transparency while protecting the security of facilities. The transparency Web site may offer a useful alternative to public tours and visits, which have been canceled at many sites.

To enhance the transparency of nuclear energy systems in the Asia Pacific, the CMC proposed making information available concerning

- Radiation in the air and water
- Operational safety of nuclear facilities
- Transportation safety
- Safety and security of spent fuel

Nuclear facility safety could combine existing on-site radiation monitors, remote monitors, and

***Nuclear Transparency** continued on page 6*

Acronyms

APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
CACE	China Arms Control Exchange
CAEA	China Atomic Energy Agency
CIAE	China Institute of Atomic Energy
CIIS	China Institute of International Studies
CMC	Cooperative Monitoring Center (Sandia National Laboratories)
CSCAP	Council for Security Cooperation in the Asia Pacific
DPRK	Democratic People's Republic of Korea (North Korea)
EURATOM	European Atomic Energy Community
IAEA	International Atomic Energy Agency
ISODARCO	International School on Disarmament and Research on Conflicts
ISP	International Security Programs (Sandia National Laboratories)
JNC	Japan Nuclear Cycle Development Institute
KEDO	Korean Peninsula Energy Development Organization
KIDA	Korea Institute for Defense Analyses
MINATOM	Ministry of Atomic Energy (Russia)
MOST	Ministry of Science and Technology (ROK)
PACATOM	Pacific Atomic Energy Community
PUNT	Peaceful Uses of Nuclear Technology (agreement)
ROK	Republic of Korea (South Korea)

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existing operational data. Confidence in safety would be increased by showing that the facility is operating normally. Partner organizations in Japan, Taiwan, Russia, and the US are already transmitting radiation safety data in this manner. South Korean data will be available in the near future. The Web team has worked to integrate the radiation data into a user-friendly display in cooperation with the Japan Nuclear Cycle Development Institute (JNC). Ms. Naoko Nakashima of the JNC-Oarai Engineering Center led this effort in 2001 and 2002 during an 18-month assignment as a Visiting Research Scholar at the CMC.

Early feedback from Web-site viewers pointed out the difficulty of following nuclear industry stories across the region. CMC Web designers built an innovative active server page so that non-html-literate staff could add news events. As a result, the Current Events section now has about 120 stories.

Ultimately, nonproliferation and material security issues are core to this project. Virtual tour technology is becoming a powerful transparency tool for public acceptance and international understanding. With our assistance, The Federation of Electric Power Companies of Japan has recently produced several virtual tours, which are now linked from the CSCAP Web site. The Web site also features back end of the nuclear fuel cycle transparency examples based on remote video cameras and a virtual tour of the Waste Isolation Pilot Plant (WIPP).

The CMC/CSCAP process is poised to move into transparency in the back end of the nuclear fuel cycle. Participants have agreed that development of appropriate transparency measures should go hand-in-hand with facility design efforts in order to gain public acceptance and regulatory approval. Three workshops at back-end facilities in Canada, Japan, and the US have emphasized issues of safety and nonproliferation in the back end and have stimulated the debate on potential regional cooperation in problems of spent fuel and waste storage. The primary goal now is to develop a demonstration of back-end transparency with a Northeast Asian partner.

Finally, the CMC has invited the Nuclear Energy Experts Group to discuss enhancing the Asian participation and ownership of the transparency process by moving the Web site to a sponsoring organization in Northeast Asia. The Republic of Korea's Ministry of Science and Technology (MOST) has appointed a study group to evaluate this concept, and several meetings in Albuquerque and Seoul have defined the issues and resources that would be required. Regional management of the Web site, with strong continuing CMC involvement, will show that this effort provides a sustainable service in safety and nonproliferation. John Olsen 5324, MS 1373, 505-284-5052, fax 505-284-5055, jnolsen@sandia.gov

Opportunities for Maritime Cooperation in the Asia Pacific

Conventional force confrontations, as potential motivators for proliferation of weapons of mass destruction (WMD), have been of strong interest to the Regional Security Program since 1994. Naval gun battles between North Korea and both South Korea and Japan and some tense confrontations in the Taiwan Strait have raised interest in maritime security issues in East Asia. For the last 18 months, we have made a concerted effort to build up maritime expertise and to advance this issue in regional security discussions.

During the last year the Cooperative Monitoring Center hosted two Visiting Research Scholars to help develop concepts for maritime cooperation and confidence building measures (CBMs). The two visiting scholars were both from Taiwan: Dr. Lee Chyungly of National Chengchi University and Cmdr. Chai Wen-Chung, a serving naval officer. The visitors wrote four papers, which can be accessed on the Web at <http://www.cmc.sandia.gov>. Although some specific conditions and conclusions directly apply to the situation in Taiwan, Dr. Lee and Cmdr. Chai analyzed maritime CBMs in the general context of East Asia as well. The principles researched by Dr. Lee and Cmdr. Chai and outlined below may have wide applicability in East Asia.

An Informal Approach to CBMs Dr. Lee Chyungly considered the question of how to start a maritime CBM process: What is the first step when CBMs seem to be stalled, as between Taiwan and the Mainland? Her recommendations centered on reducing the expectations for CBM accomplishments and allowing a more informal framework to evolve. Focusing on pragmatic and humanitarian issues, known generally as human security, would allow parties to de-emphasize military CBMs and crisis management where progress may be unlikely as a first step. Moreover, she proposed that initial CBMs have a better chance of happening through a framework of nonofficial organizations.

Specifically, Dr. Lee questioned the concept of state-centered CBMs and proposed that if improved relations were the goal, the creative use of nonofficial channels offered better prospects. The nonofficial channels could utilize retired-officials' organizations, professional groups of individuals outside of their official capacities, or research institutions.

Several concepts are important in this process. First, pragmatic actions should be emphasized, even if they individually make only incremental improvements in relations. Moreover, the actions should have some measurable effect that could, in fact, bolster the confidence of each side. The actions chosen must be realistically possible. Otherwise, the process just becomes mere shoptalk and will run out of momentum after a few meetings. Finally, and perhaps most important, the measures must not exceed the political willingness of each side.

For example, search and rescue cooperation already occurs on an irregular basis, often utilizing informal communications channels. Professional organizations representing the officers who work in rescue centers could develop better communications to enhance these informal channels. One technical measure that would act to cement this cooperation would be to purchase and install permanent, high-bandwidth communications, for example, videoconferencing capability to improve the effectiveness of search and rescue operations in bad weather. Rescues like those that have happened in the past could be made a more regular feature of regional relations, which would be a small but significant improvement.

Building toward Naval Agreements As a serving naval officer, Cmdr. Chai's focus was on the ultimate goal of incident-at-sea (INCSEA) agreements between neighbors. However, he also recognized that any kind of INCSEA agreement is an extremely unlikely first step. He considered a progression of measures that might build toward that goal in concert with gradually improving political relations.

- ***Protection of Sea Lines of Communication.*** Regions of tension or territorial dispute, like the Taiwan Strait and the South China Sea,

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pose threats to shipping in the essential sea lines of communication of East Asia. Different forms of cooperation may address the potential sources of disturbance in each of those areas: For example, piracy is a particular problem in the South China Sea and may call for coordination of patrols and satellite-based tracking systems to detect diversion of ships. Effective cooperation may be facilitated by Internet links between the Antipiracy Center and maritime authorities, shipowners, and insurance carriers.

In the Taiwan Strait, smuggling and illegal immigration are important issues. Port authorities, customs patrols, and naval patrols want better control of vessels and more assurance that documentation is not falsified. Coordination is also needed along the midline of the strait to close the enforcement gap between the patrols of Taiwan and China. Establishing a full vessel traffic services system might be a long-term goal as cross-strait traffic increases in volume. The system might be modeled after one in the Strait of Gibraltar between Spain and Morocco or one in the Strait of Juan de Fuca between Canada and the US.

- ***Military CBMs at Sea.*** Progress toward a formalized method to manage naval crises may need to be based on less formal and voluntary measures to build a political foundation. Medium-term measures could be exchanges of retired naval officers; unilateral notification of exercises; participation by active duty naval officers in track two (informal, unofficial) dialogues, such as the CSCAP process; or sending active duty officers to international training programs and think tanks. As political will increases in support of CBMs, public recognition of improved relations could be advanced by means of search and rescue joint exercises and port visits. Technical cooperation between parties might focus on establishing a common design for crisis management centers in hopes of mustering the political will to advance to that stage.

- ***Progress toward INCSEA Agreements.*** The navies of East Asia work close to shore and frequently in constricted waters where incidents could easily occur. An INCSEA agreement between neighbors might be useful to avoid accidental initiation of hostilities. The US-Soviet precedent of 1972 should be reviewed in light of East Asian circumstances. Perhaps the most valuable insights from the precedent are those identified previously by David Winkler, focusing on the navy professional-level negotiation, which was carried out in a problem solving mode. Cmdr. Chai suggests that it may be necessary to add distance formulas because of the constricted waters of East Asia. He also notes that the US-Soviet precedent did not have to contend with disputes of overlapping exclusive economic zones or disputed possession of islands.

Source: John Olsen 5324, MS 1373, 505-284-5052, fax 505-284-5055, jnolsen@sandia.gov

Cooperative Monitoring To Address Environmental Problems in Submarine Dismantlement

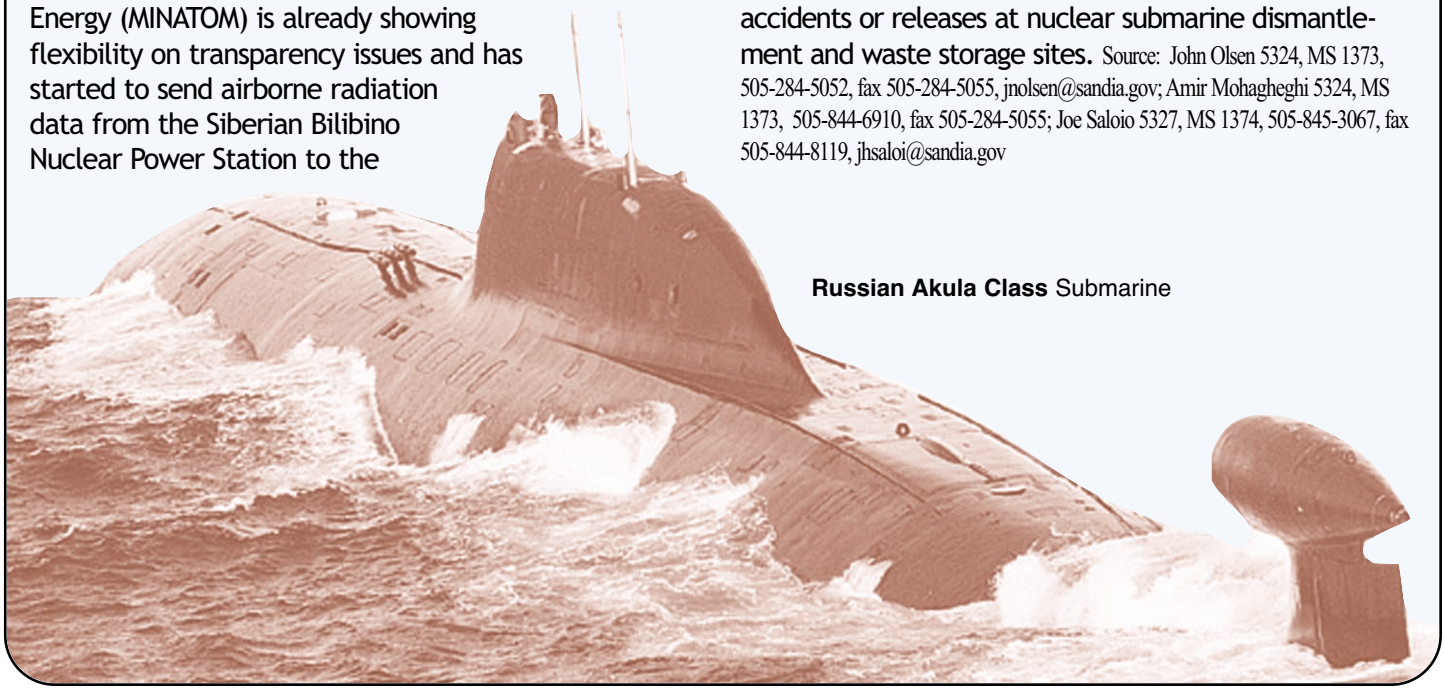
Russia's nuclear submarines in the Far East pose safety and proliferation concerns to Japan, South Korea, and the United States. In 1993 low-level waste was dumped into the Sea of Japan, and in 1985 a submarine reactor suffered a catastrophic accident. Consequently, the public is concerned about ecological consequences of potential releases of radioactivity into the air and water, while political analysts and ecological authorities are concerned about storage and transport security of irradiated fuel and high-level waste. Russian authorities could address these concerns using the same methodology as the nuclear transparency project: measuring air and water radiation rates and displaying the results on the Internet.

Russian organizations have needs for transparency that are especially oriented toward the international scene. This is a case of past problems and legacy waste limiting further development of Russian nuclear enterprise. For instance, Russia has prepared the legal framework to establish interim storage of spent nuclear fuel, a service for which regional customers may pay very well - $21 billion is often cited as the project value. Acceptance of this offer by regional parties partially depends upon perceptions that this is an environmentally sound arrangement. Therefore, demonstration of safe ecological operations in Russia has a high potential reward in the long run. The Russian Ministry of Atomic Energy (MINATOM) is already showing flexibility on transparency issues and has started to send airborne radiation data from the Siberian Bilibino Nuclear Power Station to the CMC/CSCAP nuclear transparency Web site at <http://www.cscap.nuctrans.org>.

In 1993, following a Russian submarine's direct discharge of 900 tons of low-level liquid waste into the Sea of Japan, regional concern about the problem increased greatly. As a result Japan pledged to supply a liquid waste treatment barge to filter the waste and then concentrate the waste into cemented containers.

In support of US-sponsored submarine dismantlement activities in both the Russian northwest and far east, a team of US, Russian, and French institutions designed and constructed low-level radioactive waste facilities to address these problems in Severodvinsk at the Zvezdochka Shipyard and in Bolshoi Kamen at the Zvezda Shipyard. The tangible results of this cooperation at Zvezda in the Far East are new land-based, low-level liquid radioactive waste processing and storage facilities.

One approach to alleviating the regional concerns regarding the ecological performance at Zvezda is to deploy a number of radiation monitors around the site that relay their data automatically to a central data bank in Moscow. After Russian authorities process and review the data, it could be posted on a Web site to enable regional authorities to identify and respond to accidents or releases at nuclear submarine dismantlement and waste storage sites. Source: John Olsen 5324, MS 1373, 505-284-5052, fax 505-284-5055, jnolsen@sandia.gov; Amir Mohagheghi 5324, MS 1373, 505-844-6910, fax 505-284-5055; Joe Saloio 5327, MS 1374, 505-845-3067, fax 505-844-8119, jhsaloi@sandia.gov



Russian Akula Class Submarine

Confidence Building Measures for the Korean Peninsula

The Korean Peninsula confrontation features two million combatants arrayed across the demilitarized zone (DMZ), supported by devastating firepower and, on the North, alleged nuclear-chem-bio weapon deployments. ROK's President Kim journeyed to Pyongyang in June 2000 for a face-to-face meeting with Chairman Kim Jung Il of the DPRK, and together the leaders agreed to allow visits by separated family members and to reopen road and rail links that had been closed for 50 years. Only halting progress has followed. As ROK President Kim's term comes to an end, disappointingly little has actually changed: DPRK Chairman Kim, for example, has still not made his reciprocal visit to Seoul; North and South gunboats still exchange fire in the fishing grounds; separated families meet under tight supervision; and the road/rail links are barely started. Moreover, the centerpiece of Korean nonproliferation, the Korean Peninsula Energy Development Organization (KEDO) project to deliver two power reactors to the North, has been nullified by the clandestine uranium enrichment program that the DPRK revealed in October 2002.

The new South Korean administration must manage North-South relations to contain crises and to prepare a foundation for eventual reconciliation. The alternative of outright warfare is simply unacceptable. North Korea apparently understands this imperative and moderates its threats by suggesting cooperative measures to avoid conflict or to gain economic assistance. Therefore, both sides might search for confidence building measures (CBMs) to reinvigorate reconciliation. The Cooperative Monitoring Center (CMC), in cooperation with the Korea Institute for Defense Analyses (KIDA), has studied a comprehensive framework for cooperation to identify some timely options.

Border Monitoring and Conventional Forces The greatest area of progress over the last two years has been North-South agreement on reopening rail and road links across the DMZ. Despite various bilateral difficulties, implementation agreements are inching forward. South Korea has constructed the road and the rail line up to the DMZ, complete with a rail station at Dora-san. Demining is proceeding on both sides to clear a right-of-way for construction, and a fax line has been run across the DMZ. Both sides have signed a 38-point security agreement for the construction effort. However, real questions about long-term security within the breaches in the 50-year-old protective barrier are being raised on both sides:

- Opening the rail and road links requires removal of land mines and breaching of passive defense measures in two corridors. The first-order threat to both sides is a major frontal assault. In addition, the South is concerned about commando infiltration, refugee flow, and smuggling through these corridors. These security concerns might be addressed with the introduction of ground sensors to provide intrusion detection. The initial CBM could be a demonstration of such sensors for both sides at a neutral site, followed by convening a North-South working group to design a mutually agreed-upon monitoring system. The CMC's Outdoor Test Facility might be a possible site for training and demonstration to support this activity. Finally, the sensors could be introduced into the corridors to supplement existing and planned security measures.

- For the new corridors to have an actual economic benefit, commercial vehicles will have to transit the border crossings with minimal delays. A practical CBM could focus on North-South joint development of an electronic customs procedure, based on a US-Mexico prototype: Advanced Technologies for International and Intermodal Ports of Entry (ATIPE). A software- and Internet-based customs exchange could allow inspections of sealed containers at shipping points and expedited inspection at the border. Similarly, cargo-scanning systems must be integrated into the road/rail corridors, otherwise the proposed economic benefits of cross-border manufacturing are unlikely to be realized. Customs officials from both sides, but especially the North, would benefit from

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training workshops and visits to US border crossings where these technologies are in use.

- Verifiable reduction of conventional force threats in both directions could be served by a cooperative aerial reconnaissance agreement. A first CBM step would be to convene a demonstration workshop for officers of both sides to provide a common understanding of how such an agreement functions. The bilateral flights between Hungary and Romania might be the best example of such an agreement and the best venue for such a workshop. Hungary has indicated willingness to host a demonstration event.

Maritime Measures Maritime disputes in coastal shipping and fisheries have disrupted North-South relations over the past few years, including this year. The primary event is exchange of gunfire around the crab fishing grounds, which are just south of the disputed maritime border, occurring in June at the height of the crab season. Moreover, since the North and South are still officially at war, innocent passage for cargo ships is not recognized by the South for transports heading into North Korean ports. Consequently, Northbound ships must either follow circuitous routes or risk interception by South Korean patrol boats. CBMs would allow both sides to limit their exposure to accidental conflict or uncontrolled escalation in the event of a confrontation:

The ROK raises a patrol boat sunk in a June 2002 fisheries dispute.

- Tracking of fishing vessels and coastal shipping has solved certain resource and coastal security issues that bear some similarity to the Korean situation. The tracking and traffic management technologies are commercially available, but the North has had very little exposure to them, due to economic constraints.

- Incident-at-sea (INCSEA) agreements have worked to defuse naval confrontations elsewhere, particularly between the US and the Soviet Union in the 1970s. Adaptation to the Koreas could be studied in workshops and exchanges, drawing upon precedents from around the world.

Nuclear Nonproliferation The DPRK record regarding compliance with the *Nuclear Nonproliferation Treaty (NPT)* has been a very sensitive topic since 1992. In 1994 the US, South Korea, and Japan joined in an *Agreed Framework* with the DPRK to supply two nuclear power reactors to the North in exchange for cessation of construction of indigenous, graphite-moderated reactors. Prior to completion of the new KEDO reactors, the IAEA would have to certify that the North was in compliance with their safeguards obligations. The *Agreed Framework* did

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halt construction of unsafeguarded reactors in the North and secured the facilities storing nuclear materials until the future time that IAEA inspections would resume. The *Agreed Framework* also provided leverage for the North to allow the US to inspect a suspicious tunnel complex that was perhaps a nuclear development site.

Regrettably, the North continued a clandestine program to enrich uranium to highly enriched uranium (HEU), although this too was implicitly barred by the *Agreed Framework*. Revelation of the secret HEU program has caused reexamination of the reactors to be supplied to the North, just after pouring the first concrete. The HEU program revealed in 2002 and the reprocessing effort revealed in 1992 both violated the South-North Denuclearization Agreement. Restarting North-South nuclear nonproliferation cooperation could return to that fundamental agreement or to an updated successor document. North-South nuclear inspections could be integral to that process:

- The US can assist the inspection process by training the respective inspection teams. The terms of any future North-South nuclear accord may not be the same as an IAEA safeguards agreement; therefore, special training might be needed. Elements of Sandia's ACE-IT (Augmented Computer Exercise for Inspection Training) family of on-site inspection training simulations may be applicable.

- Until new North-South nuclear accords are reached, the CMC could help bring the DPRK into some awareness of regional norms through the CSCAP nuclear transparency project. The North will be invited to send observers to the next Nuclear Energy Experts Group meeting in late Spring 2003.

Source: John Olsen 5324, MS 1373, 505-284-5052, fax 505-284-5055, jnolsen@sandia.gov; Michael Vannoni 5324, MS 1373, 505-284-5050, fax 505-284-5055, mgvanno@sandia.gov; Jennifer Koelm 5324, MS 1373, 505-845-0743, jgkoelm@sandia.gov

Getting Crabby at the Crab Grounds

The past twelve months have seen both progress and disappointment in maritime cooperation, and even contradictory trends have been experienced involving the same countries. For example, North Korea engaged in an exchange of fire with South Korea that resulted in the sinking of an ROK patrol boat at disputed crab fishing grounds, but the DPRK also agreed with the United Nations Command to cooperate in sea rescue in the same area. Some parties have taken a more active role in cooperation: Japan agreed to antismuggling cooperation with Russia and also sent an antipiracy patrol boat to Southeast Asia. Similarly, India joined with the US in sending antipiracy patrols to the Malacca Strait.

Progress was made in controlling possible disputes in the South China Sea when ASEAN (Association of Southeast Asian Nations) members signed a Code of Conduct, which China pledged to observe. Other incidents could have escalated, including many fisheries disputes and a dispute over an oceanographic vessel in China's exclusive economic zone. A narrowly avoided confrontation concerned an alleged Chinese reconnaissance vessel near Taiwan's missile test base. Sources: "Four Dead, One Missing in West Sea Battle," Chosun Ilbo, 29 June 2002; "UNC, N. Korea Agree on Emergency Life Saving in West Sea," Korea Times, 13 August 2002; Japan Today, 26 February 2002; Japan Times, 17 July 2002; "India, US Begin Joint Patrolling," Hindustan Times, 19 April 2002; "Beijing Protests US Navy Ship's Collision with Chinese Fishing Vessel," Reuters, 27 September, 2002; "Chinese Spy Ship Driven off Southeastern Taiwan," Agence France-Presse, 12 October 2002.

Calendar: Visits, Workshops, and Conferences

Workshops and Conferences

February 22-28 Tucson, AZ: Sandia and MCC participate in Waste Management Symposia. (NA-24) Cecelia Williams 6245, 505-844-5722; Rally Barnard 5327, 505-284-4605

February 22 – March 1 Picatinny, NJ: Sandia organizes and participates in Lightning Workshop at Picatinny Arsenal, NJ, with Russian representatives from MINATOM, MOD, VNIITF, VNIIEF, VNIIA, Institute of Pulse Technics, and Central Physical Technical Institute. (DTRA) Jim Arzigian 5327, 505-844-2747

March 29 – April 5 Orlando, FL: Sandia participates in Advantor Access Control Equipment training at Advantor facilities with representatives from ISTC and STL. (NA-25) Laverne Romesberg 5323, 505-844-2095

March 31 - April 11 Brno, Czech Republic: Regional Training Course on Physical Protection (NA-243, IAEA) David Ek 5323, 505-845-9891

April 23-25 Albuquerque, NM: Sandia National Laboratories' Thirteenth Annual International Security Conference (formerly known as the Arms Control Conference) will convene at the Hyatt Regency Hotel. (DOE/NNSA, DTRA, DOS, Aquila Technologies, Chemical and Biological Arms Control Institute; Veridian Corporation) < http://www.IntlSecConf.sandia.gov> Evangeline Clemena 5302, 505-284-5047; Jim Brown 5302, 972-661-3261

April 29-May 1 Oak Ridge, TN: Spring 2003 INMM Safeguards and Security Workshop, "Safeguards and Security: A New Era" will be held at the Oak Ridge Crown Conference Center. Stephen Ortiz 5838, 505-845-8098

July 13-17 *Phoenix, AZ:* Institute of Nuclear Materials Management (INMM) 44th Annual Meeting will be held at the Marriott Desert Ridge Resort and Spa. John Matter 5323, 505-845-8103

September 6-26 Albuquerque, NM: Seventeenth International Training Course on Physical Protection of Nuclear Materials and Facilities (NA-243, IAEA) David Ek 5323, 505-845-9891

February 29 – March 4, 2004 Charleston, SC: American Nuclear Society (ANS)-INMM 7th International Conference on Facility Operations – Safeguards Interface. <http://ntr.ornl.gov/ANS2004/> Janie McCowan, ORNL, 865-576-4003; Teressa McKinney, ORNL, 865-241-9695

Visits

January 27-31 Washington, DC: Sandia, DTRA, and DOE representatives participate in TOBOS Program Workshop meetings with Russian representatives from VNIIA, MOD, and MINATOM to review construction progress at the Model Test Site in St. Petersburg and to engage the MOD Weapon Safety and Security Research Center (NITs BTS) in defining requirements for the test program. (NA-115.1) Greg Mann 5327, 505-844-6795

February 1-9 Albuquerque, NM: Sandia hosts SPEKTR Conversion representatives for SPEKTR Conversion project review meetings. (NA-24) Deepesh Kholwadwala 15222, 505-284-3683

February 2-5 Philadelphia, PA: Sandia and VNIIA participate in Marketing Center proposal review at the University City Science Center. (NA-115.1) Robert Huelskamp 5327, 505-844-0496

February 22-26 Albuquerque, NM: Sandia hosts SPEKTR Conversion for SPEKTR Conversion project review meetings. (NA-24) Deepesh Kholwadwala 15222, 505-284-3683

February 28 – March 5 Washington, DC: Sandia and MCC participate in IPP meetings regarding the ESR project. (NA-24) Cecelia Williams 6245, 505-844-5722; Rally Barnard 5327, 505-284-4605

March 3-7 Albuquerque, NM: Sandia hosts VNIITF representatives for a Trusted Processor project review meeting. (NA-241) Jose Saloio 5327, 505-845-3067

March 24 – April 11 Westminster, CO: SPEKTR Conversion participates in Spatial software training at the Spatial corporation headquarters facility in order to support Sandia IPP projects. (NCI Infrastructure Project) Elaine Hinman-Sweeney 15222, 505-845-2780

April St. Petersburg, Russia: Sandia performs facility acceptance walk-through of the Model Test Facility with the NITs BTS officials. (NA-115.1) Greg Mann 5327, 505-844-6795

China-US Counterterrorism Cooperation

Le Rongrong
China Institute of International Studies, Beijing, Peoples' Republic of China

Terrorism has long been recognized as a major threat to the security of states. However, the September 11, 2001, attacks have underscored the seriousness of this threat and made global cooperation in combating terrorism both necessary and pressing. All countries share the responsibility to eradicate this menace and safeguard international peace and stability. To this end, we should take the same resolute position against terrorism no matter when, where, and in what form it occurs or at whom it is targeted.

The recognition of terrorism as a predominant international threat began at the end of the 1960s. During 1968 to 2001, terrorist incidents greatly increased in the 1970s and 1980s then declined in the 1990s, especially after the end of the Cold War. However, the severity of and the casualties from attacks have become much more serious. The United States has been and remains the top target of international terrorist attacks. After the end of the Cold War, anti-US terrorist attacks have declined in number but have resulted in increased and more serious casualties. Based on the number of attacks and the resulting casualties, Asia has become the second most affected region in the last six years. The prevalent methods employed by terrorists were bombing, armed attacks, kidnapping, hijacking, and assassination, accounting for over 80 percent of the totals. The foremost targets were business related, and the attacks targeted at nonofficial interests greatly exceeded those targeted at official interests. This trend continues.

International terrorism, as well as other nontraditional security problems, is derived from a combination of political, economic, ethnic, and religious conflicts and has deep-rooted historical and cultural dimensions. Poverty, development gaps, and a variety of social injustices are fertile breeding grounds for its growth.

China is also a victim of terrorism. In an effort to found a state of East Turkistan, the Al Qaeda-linked East Turkistan forces have plotted a series of incidents in the Xinjiang region of China and in other countries. Especially in the last decade, these terrorist activities have seriously threatened the security and stability of China and Central Asia.

Thanks to close cooperation among the countries involved, the international counterterrorism campaign has made positive headway over the past year. But as the terrorist threat is transnational and deep-rooted in diversified contradictions, this campaign will be a long, hard-fought confrontation. Efforts should be made to work out a comprehensive strategy on the basis of the UN Charter to treat both the symptoms and the root causes of terrorism. At the same time, we must avoid linking terrorism to specific countries, ethnic groups, or religions.

China and the US are permanent members of the UN Security Council with a wide range of common interests. Because both are victims of terrorism, fighting terrorism has become a major shared interest. In the war on terror, the Chinese and the Americans are determined to stand together and carry out effective cooperation under a mechanism set up by the presidents of the two countries in October 2001 at the APEC (Asia-Pacific Economic Cooperation) Summit in Shanghai. In a recent visit to the US, Chinese President Jiang Zemin stated that China will continue to step up its consultation and cooperation with the US on counterterrorism and will join the rest of the world in the concerted fight against this common scourge.

Among the varied facets of this cooperation, technical cooperation could be further expanded and

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strengthened. Science and technology can support essential security measures, which will help prevent and minimize the damage from future terrorist attacks. The following areas identify potential choices for expanded cooperation:

- ***Protecting critical infrastructure and key assets.*** Operation of modern society depends on networks of infrastructure. Attacking one or more pieces of those assets could cause huge damage to the country. The technology of physical protection could be an effective means to tackle the problem.

- ***Preventing catastrophic threats.*** Threats of terrorists using explosives or chemical, biological, radiological, and even nuclear weapons potentially exist, and the consequences could be catastrophic. To deal with those threats, technologies to detect explosives and nuclear materials and to protect certain biological materials could provide countermeasures.

- ***Safeguarding transportation security.*** Terrorists may use international transportation to carry out an attack on a major port or city. Thus, providing transportation security while promoting the efficient flow of people and goods is an important field for cooperation. Several measures may be considered, including inspection of international shipments, electronic seals, and electronic documentation exchanges.

- ***Safeguarding border security.*** China has land borders 22,800 km long and links with South and Central Asia where active terrorist groups are located. Protecting such long borders in remote areas is a difficult task. Intrusion detection and surveillance technologies can help increase the effectiveness of border security forces, while increasing their own security. The Cooperative Monitoring Center has an outdoor test facility to demonstrate and test border-monitoring technologies, which might provide a basis for cooperation.

- ***Technical training.*** Training can help to raise the capability for both China and the US. The US has advanced technology and rich expertise to tackle terrorism; China also has its strong points. Technical training workshops, legal and financial training seminars, police and other security force training, and joint China-US training for the region could benefit both sides.

Other areas of possible cooperation include information and intelligence sharing, cooperation in the economic field, law enforcement, and multilateral frameworks. These ideas are offered to assist Chinese and US authorities in identifying useful modes of cooperation in the counterterrorism fight. Promoting cooperation in this campaign will not only benefit the global antiterrorism efforts but will also encourage healthy growth of a constructive and cooperative relationship between the two countries.

Le Rongrong, a staff member of the China Institute of International Studies (CIIS), has been a Visiting Scholar at the Cooperative Monitoring Center from May through December 2002. Ms Rongrong has also been Director of the Secretariat for the Council of Security Cooperation in the Asia Pacific (CSCAP)-China. Previously she worked for financial institutions both in China and in New York. Before receiving an MBA from Long Island University, she worked in the Ministry of Foreign Affairs and had assignments to the Chinese Embassy in Zaire and the Chinese Mission to the United Nations in New York.

Opinions expressed by the Guest Editor are not necessarily the opinions of Sandia National Laboratories

Engagement with China

As China continues rapid economic development and military modernization, the US seeks to manage its relations with China, with the objectives of maintaining regional security and advancing nonproliferation goals. Primary nonproliferation goals address protection of weapons and materials against theft, diversion, or terrorist attack. Combating terrorism can also be expanded to include topics in critical infrastructure, border protection, and port security, among others. Sandia's Regional Security Program is proceeding to engage China on several fronts.

Combating Terrorism Presidents Bush and Jiang have repeatedly agreed to US-China cooperation in combating terrorism. China is anxious to quell separatist groups in the Xinjiang province, while the US wishes to deny Al Qaeda elements refuge in China's vast western reaches. Security of commerce from Chinese ports and freezing of terrorist funds in China's banking system are also key US goals. As a 2002 Visiting Research Scholar from Beijing, Ms. Le Rongrong studied opportunities in this area at the Cooperative Monitoring Center (CMC) and has reported the results of her studies to various ministries in Beijing.

Terrorist activities in China have centered on bombings of public places and transportation, specifically buses. Chinese concerns focus on infiltration across Central Asian borders by Al Qaeda-trained extremists and clandestine training and arms manufacturing sites within Xinjiang. The arms captured thus far have mainly been grenades, antitank rounds, and automatic weapons.

The CMC displays various border monitoring technologies, particularly at the CMC's outdoor test facility, that might be helpful. China's 22,800-km border requires that monitoring be selective; however, in remote western China traditional smuggling and trade routes can be emphasized. Ms. Le's report stresses that existing technologies can improve the effectiveness of border guards and can also provide some safety for their outposts. Technologies for detecting smuggled nuclear material, developed for the Second Line of Defense program in Russia and Central Asia, might also be offered to China. Reflecting the magnitude of US-China trade, the security of commerce should also be strengthened. Technologies for port security – cargo scanning, explosive and nuclear materials detection, and fraudulent

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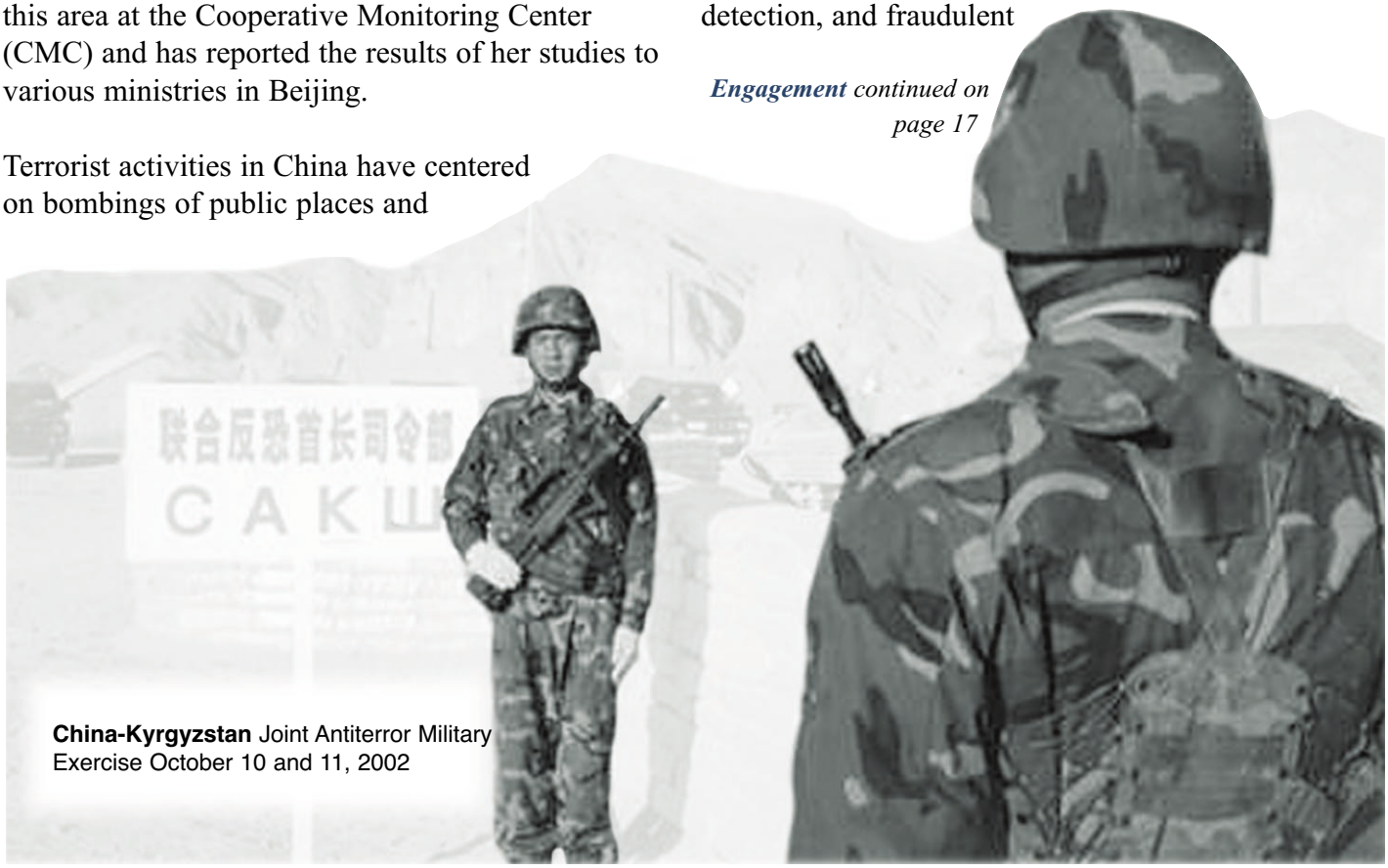

China-Kyrgyzstan Joint Antiterror Military Exercise October 10 and 11, 2002

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documentation detection – are all good topics for cooperation and training.

The assassination of government officials by Xinjiang terrorists suggests that physical protection of government offices, industrial sites, and critical infrastructure should be considered, as these are all symbols of government authority and investment.

Physical Protection of Nuclear Facilities
Sabotage of nuclear facilities and theft of nuclear materials are potential problems in China because of separatist terrorism in western China. Physical security experts from Sandia's International Security Center 5300 and Security Systems and Technology Center 5800 conducted physical protection workshops in China in 1998 and 2000 under International Atomic Energy Agency (IAEA) auspices. This effort continued in December 2002 in China with an IAEA regional training course, which included attendees from China, North and South Korea, Russia, India, and Pakistan.

Following the latest workshop, the Chinese nuclear authorities expressed interest in strengthening ties between the US and China on physical security. Future activities could expand to joint development and evaluation of protection technologies, demonstration projects, and technical staff exchanges, as well as more regional workshops. By this process Sandia can strengthen material protection in China and will encourage China to play a positive role in regional nonproliferation activities.

Regional Security Cooperation China participates in the Council for Security Cooperation in the Asia Pacific (CSCAP) along with 18 other countries and Taiwan. Through CSCAP, the CMC engages Chinese specialists in the Maritime Cooperation, the Confidence and Security Building Measures (CSBMs), and the North Pacific Working Groups. Each of these presents a different window into Chinese thinking on security and nonproliferation.

The CSBM Working Group has provided a forum for the CMC's nuclear transparency effort. While having less concern for public acceptance than its neighbors, China does intend to meet regional norms in its nuclear industry and is gradually following the transparency trend. The CSCAP/CMC Web site has agreed-upon links to the Chinese nuclear industry, some press releases, annual airborne radiation report data, and an industry summary supplied by CSCAP-China.

The CSCAP Maritime Cooperation Working Group provides an opportunity to introduce concepts of maritime confidence building measures (CBMs), some of which may be applicable in the Taiwan Strait. Similarly, the North Pacific Working Group affords a venue to brief North Korean analysts on CBMs in the presence of their long-time Chinese friends.

Another regional cooperation opportunity is cross-border water quality monitoring cooperation. The South Asia program, coordinated by Sandians David Betsill and Guarav Rajen, both of Sandia's International Security Initiatives Department, sponsors a successful exchange of water quality data from India, Bangladesh, and Pakistan. The headwaters of many of South Asia's major rivers lie in China's Tibet Autonomous Region. In the coming year the East Asia program will seek to develop Chinese interest in joining the water quality cooperation.

Biosecurity The outbreak of avian influenza in Hong Kong in 2001 resulted in the slaughter of over 1.2 million live birds and a four-week halt of retail poultry sales. A similar 1997 outbreak in Guangdong Province and Hong Kong had led to numerous human infections of the avian flu in addition to disruption of the poultry industry. Although these were natural outbreaks, an intentional attack could prove even more devastating. A cooperative endeavor to secure certain animal and plant pathogens at agricultural research facilities could address both Chinese and US concerns and serve their mutual interests.

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Reynolds Salerno of Sandia's International Security Initiatives Department is currently assisting the US Departments of Agriculture, Defense, and Energy to develop security plans and standards for various high-containment microbiological research laboratories in the US. Those plans will be confidential, but the concepts and methodologies should interest Chinese authorities who confront similar responsibilities. In addition, a bilateral interaction of this sort could contribute to the development of internationally acceptable biosecurity guidelines.

Arms Control Exchange Technical exchanges in support of arms control treaties have been a fruitful area of interaction with Chinese scientists and engineers. Originally initiated to develop Chinese support for the Comprehensive Test Ban Treaty, such cooperation in the past has touched on export controls, cooperative monitoring for regional security, and nuclear material control. This cooperation is kept under strict oversight in both countries because it involves nuclear weapons institutions on both sides. The sensitivity of the interaction generally has limited the flexibility and utility of the process.

Recently the same institutions, plus many other organizations, met in Beijing to discuss arms control issues under the broader framework of ISODARCO (International School on Disarmament and Research on Conflicts). This broader scope included European and other Asian representatives, mostly on a nongovernmental level. In that context, ISP personnel could introduce new proposals for cooperation in combating terrorism that might be informally linked to the former Arms Control Exchange. US-China cooperation may restart in this calendar year with a focus on export control, physical protection, and other nonproliferation issues. Source: John Olsen 5324, MS 1373, 505-284-5052, fax 505-284-5055, jnolsen@sandia.gov and Terri Olascoaga 5302, MS 1375, 505-845-9461, fax 505-284-9043, mtolasc@sandia.gov

Inspection of Chinese four-person semisubmersibles in April 2000

Sandia Conducts IAEA Physical Protection Course in China

Sandia National Laboratories conducted a Regional Training Course on the Physical Protection of Nuclear Facilities and Materials in Beijing on December 4-18, 2002. The International Atomic Energy Agency (IAEA) sponsored the course, which included a field trip to the Daya Bay Nuclear Power Plant. The Chinese host organizations were the China Atomic Energy Agency (CAEA) and the China Institute of Atomic Energy (CIAE).

Students who attended the course represented six countries in the region: China, Russia, India, Pakistan, the Republic of Korea, and the Democratic People's Republic of Korea. The six US instructors and one support staffperson came from Sandia's International Security Center 5300 and Security Systems and Technology Center 5800. Ron Cherry, Director of the Department of Energy National Nuclear Security Administration's Office of International Safeguards NA-243, briefly observed the training course.

The course that was conducted in China is a spin-off from the biennial International Training Course on the Physical Protection of Nuclear Facilities and Materials that Sandia conducts in Albuquerque for IAEA and its member countries. The course focuses on an integrated approach to the analysis and design of physical protection systems through a sequence of group lectures and subgroup exercises. The student body learned together in a cooperative environment and demonstrated good understanding of the basic physical protection concepts in the final analysis/upgrade exercise.

Several students expressed interest in additional training classes and cooperative projects in physical protection. John Matter, Manager of International Safeguards and Technical Applications Department 5323, attended a meeting between Ron Cherry and CAEA officials regarding potential joint projects in nuclear material security and accounting. Activities such as these joint projects might be conducted under the IAEA Nonproliferation Treaty umbrella or under a bilateral agreement such as the Peaceful Uses of Nuclear Technology (PUNT).

Source: John Matter 5323, MS 1361, 505-845-8103, fax 505-284-5437, jcmatte@sandia.gov

Instructor Jose Rodriguez 5355 leads his Chinese subgroup in a physical security class exercise.

Thirteenth Annual International Security Conference

Sandia National Laboratories' International Security Programs is proud to sponsor the 2003 International Security Conference, formerly known as the Arms Control Conference. The conference will convene at the Hyatt Regency Hotel in Albuquerque, New Mexico, April 23 through 25, 2003.

Conference Chair Dr. James Brown of Sandia's International Security Center stated that the conference has adopted a new name to reflect its evolving nature. The thirteenth annual conference continues to provide a unique forum that enhances the synergy between policy makers and the technical community. Representatives of over 30 countries, comprising internationally known experts from government, business, armed forces, and academia, will engage in productive discussions addressing nonproliferation, arms control, and other international security issues.

In addition to the Department of Energy National Nuclear Security Administration, government sponsors of the 2003 conference include the Defense Threat Reduction Agency and the Department of State. Corporate Sponsors include Aquila Technologies, Chemical and Biological Arms Control Institute, and Veridian Corporation.

Thirteenth Annual International Security Conference

http://www.IntlSecConf.sandia.gov

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