



# BI-WEEKLY TREATY REVIEW



06 June – 19 June 2012

**DTRA**

## ARMS CONTROL (GENERAL)

### **Hungary Hosts Yearly NATO Meeting on WMD Arms Control, Nonproliferation**

*Global Security Newswire, 18 June 2012; <http://www.nti.org/gsn>*

Hungary last week hosted an annual NATO event in which 130 senior officials from approximately 60 nations and entities discussed stemming the spread of unconventional weapons. (298 words) [Click here for full text.](#)

### **Reinforcing Stability through Missile Defense**

*U.S. Department of State, 06 June 2012; <http://www.state.gov>*

*Remarks by Frank A. Rose, U.S. Deputy Assistant Secretary of State for Space and Defense Policy*

Today, the threat from short-, medium-, and intermediate-range ballistic missiles to our deployed forces, allies, and partners is growing. This regional threat is likely to increase in both quantitative and qualitative terms in the coming years, as some states are increasing their inventories, and making their ballistic missiles more accurate, reliable, mobile, and survivable. (1,832 words) [Click here for full text.](#)

## BIOLOGICAL WEAPONS CONVENTION (BWC)

### **Australian Researchers Make Headway on Hendra Virus Treatment**

*Global Security Newswire, 11 June 2012; <http://www.nti.org/gsn>*

Australian scientists have made headway in their pursuit of an antidote to the lethal Hendra virus, and have obtained government financial support to continue their work, Griffith University announced last week. (251 words) [Click here for full text.](#)

## CHEMICAL WEAPONS CONVENTION (CWC)

### **Decision on Chemical Weapons at Blue Grass Depot Awaits Year-Long Study**

*Greg Kocher, The Lexington Herald-Leader (KY), 13 June 2012; <http://www.herald-leader.com>*

Local officials learned Wednesday that an environmental assessment of the proposal will take about a year to complete. The assessment is required by the National Environmental Policy Act or NEPA. The 42-year-old law requires federal agencies to consider the environmental impact of their proposed actions, outline alternatives and accept public comment. (438 words)

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## CHEMICAL WEAPONS CONVENTION (CWC) (CONT'D)

### **Preparations Begin for 3rd Review Conference**

*Organization for the Prohibition of Chemical Weapons, 08 June 2012; <http://www.opcw.org>*

The Open Ended Working Group (OEWG) for preparation of the Third Review Conference of the States Parties of the Chemical Weapons Convention (CWC) to review the operation of the Convention held its first meeting on June 7, 2012. The Conference will be held from April 8-19, 2013 in The Hague. (249 words) [Click here for full text.](#)

### **Sarin Nerve Agent Destruction Wraps up at Russian Depot**

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The elimination of munitions loaded with sarin nerve agent has concluded at Russia's Shchuchye complex, though the installation continues to hold chemical-weapon materials including soman and VX, Interfax quoted a site spokesman as saying on Tuesday. (132 words) [Click here for full text.](#)

## COMPREHENSIVE NUCLEAR TEST-BAN TREATY (CTBT)

### **UN Cash Gap May Hinder its Nuclear Role**

*Reuters, 13 June 2012; <http://www.reuters.com>*

The United Nations' nuclear agency is significantly underfunded, a think-tank said on Wednesday, warning the shortfall risked limiting its ability to identify covert atomic activity that might have a military dimension. (581 words) [Click here for full text.](#)

### **Supercomputer Simulates Nuclear Explosion Down to the Molecular Level**

*io9 Online, 06 June 2012; <http://www.io9.com>*

Treaties forbid the detonation of nuclear test weapons – which creates problems for national defense developers who need to efficiently certify the effectiveness of their arsenal. Luckily for them, a powerful new supercomputer is now able to replicate the physical impact of nuclear explosions – albeit digitally. And luckily for us, the resulting innovations may spill over to more constructive areas. (365 words) [Click here for full text.](#)



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## COOPERATIVE THREAT REDUCTION (CTR)

### **Two Nuclear Weapons Shipments Secured through CTR**

Senator Lugar Official Website, 05 June 12, <http://lugar.senate.gov>

Today, U.S. Senator Dick Lugar announced continued progress in Nunn-Lugar Global in April 2012. (399 words) [Click here for full text.](#)

## NEW STRATEGIC ARMS REDUCTION TREATY (NEW START)

### **Yury Dolgoruky Completes Initial Sea Trials**

Ria Novosti, 06 June 2012; <http://en.rian.ru>

Russia's latest ballistic missile submarine, the Borey class Yury Dolgoruky will complete an initial sea trial on June 7, its maker Sevmash shipyard said on Tuesday. (185 words)

[Click here for full text.](#)

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## **Hungary Hosts Yearly NATO Meeting on WMD Arms Control, Nonproliferation**

*Global Security Newswire, 18 June 2012; <http://www.nti.org/gsn>*

Hungary last week hosted an annual [North Atlantic Treaty Organization (NATO)] event in which 130 senior officials from approximately 60 nations and entities discussed stemming the spread of unconventional weapons.

The eighth-annual NATO Conference on Weapons of Mass Destruction Arms Control, Disarmament and Nonproliferation was anchored by the Hungarian Foreign Ministry; the two-day event opened last Thursday, according to a release from the military alliance.

"The fact that so many of you have come to take part shows that we face serious, persistent challenges in this area," NATO Deputy Secretary General Alexander Vershbow said to conference participants via video. "But it is also a strong demonstration of our resolve to work together to meet these challenges."

The spread of unconventional weapons as well as the technology to deliver them in attacks "threatens our shared vision of creating the conditions necessary for a world without nuclear weapons," the release quotes Vershbow as saying.

The conference featured discussions on extremism and the spread of weapons of mass destruction [WMD]; NATO's role in global efforts to reduce and eliminate unconventional arsenals; ongoing sectoral WMD proliferation problems; and the future of multinational counterproliferation efforts.

"Our gathering today could hardly be timelier. The proliferation landscape is getting ever more complex and worrying," said NATO Assistant Secretary General and conference Chairman Gábor Iklódy.

Iklódy did highlight a number of areas for optimism on the WMD elimination front such as the U.S.-Russia New START nuclear arms control pact, this spring's Nuclear Security Summit in South Korea, and ongoing talks aimed at one day declaring the Middle East a WMD-free region.

Pacific and Asian countries sent representatives to the conference as did the Euro-Atlantic Partnership Council, the Mediterranean Dialogue, the European Union, the Preparatory Commission for the Comprehensive Nuclear Test-Ban Treaty Organization and the Organization for the Prohibition of Chemical Weapons.



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## Reinforcing Stability through Missile Defense

U.S. Department of State, 06 June 2012; <http://www.state.gov>

Remarks by Frank A. Rose, U.S. Deputy Assistant Secretary of State for Space and Defense Policy  
[...]

### *Missile Defense Policy*

Today, the threat from short-, medium-, and intermediate-range ballistic missiles to our deployed forces, allies, and partners is growing. This regional threat is likely to increase in both quantitative and qualitative terms in the coming years, as some states are increasing their inventories, and making their ballistic missiles more accurate, reliable, mobile, and survivable.

Recognizing the seriousness of the ballistic missile threat, the United States seeks to create an environment, based on strong cooperation with allies and partners, which will diminish an adversary's confidence in the effectiveness of ballistic missile attacks. This will devalue ballistic missiles and provide a disincentive for their development, acquisition, deployment, and use. To that end, President Obama has made international cooperation on missile defense a key priority, and we are pursuing a region-by-region approach based on the following three principles:

First, the United States will strengthen regional deterrence architectures built upon solid cooperative relationships with an eye toward efficiently incorporating assets and structures that our partners already have today or are seeking.

Second, the United States is pursuing phased adaptive approaches (PAAs) to missile defense within key regions that are tailored to their unique deterrence requirements and threats, including the scale, scope, and pace of their development, and the capabilities available and most suited for deployment. Specifically, we will phase in the best available technology to meet existing and evolving threats, and adapt to situations that evolve in the future.

Third, recognizing that our supply of missile defense assets cannot meet the global demand we face, the United States is developing mobile capabilities that can be relocated to adapt to a changing threat and provide surge defense capabilities where they are most needed.

Missile defense plays an important role in the broader U.S. international security strategy, supporting both deterrence and diplomacy. Missile defense assures our allies and partners that the United States has the will and the means to deter and, if necessary, defeat a limited ballistic

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missile attack against the U.S. homeland and regional ballistic missile attacks against our deployed forces, allies, and partners.

## *NATO and European Missile Defense*

Today I will focus on our work in Europe, which continues to receive a great deal of attention. In order to augment the defense of the United States against a future long-range threat and provide more comprehensive and more rapid protection to our deployed forces and European allies against the current threat, President Obama outlined a four-phase approach for European missile defense called the European Phased Adaptive Approach or EPAA. Through the EPAA, the United States will deploy increasingly capable BMD assets to defend Europe against a ballistic missile threat from the Middle East that is increasing both quantitatively and qualitatively.

The EPAA is designed to protect our deployed forces and allies in Europe, as well as improve protection of the U.S. homeland against potential ICBMs from the Middle East. As part of Phase 1, we have deployed to Turkey, a missile defense radar, referred to as the AN/TPY-2 radar. Also, as part of Phase 1, the United States deployed a [ballistic missile defense (BMD)]-capable Aegis ship to the Mediterranean Sea in March of 2011, and has maintained a BMD-capable ship presence in the region ever since.

Slightly more than a year ago, we concluded negotiations with Romania to host a U.S. land-based SM-3 BMD interceptor site, designed to extend missile defense protection to a greater portion of Europe. The land-based SM-3 system to be deployed to Romania is anticipated to become operational in the 2015 timeframe. We also reached an agreement with Poland to place a similar U.S. BMD interceptor site there in the 2018 timeframe, which will extend missile defense protection to all of NATO Europe.

The Obama Administration is implementing the EPAA within the NATO context. At the 2010 Lisbon Summit, NATO heads of state and government approved a new strategic concept and took the historic decision to develop the capability to defend NATO European populations and territory against the growing threat from ballistic missile proliferation. The allies also welcomed the EPAA as a U.S. national contribution to the new NATO territorial missile defense capability, in support of our commitment to the collective defense of the alliance under Article 5 of the North Atlantic Treaty. At the Lisbon Summit, NATO heads of state and government also decided to expand the scope of the NATO Active Layered Theatre Ballistic Missile Defense (ALTBMD) program to serve as the command, control, and communications network to support this new



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capability. NATO allies have committed to investing over \$1 billion for command, control, and communications infrastructure to support NATO missile defense.

On May 20-21, the NATO heads of state and government met in Chicago for the NATO Summit and announced that NATO has achieved an interim BMD capability. This means that the alliance has an operationally meaningful standing peacetime ballistic missile defense [BMD] capability. NATO also agreed on the command and control procedures for ballistic missile defense, designated Supreme Allied Commander Europe (SACEUR) as the commander for this mission, and demonstrated an interoperable command and control capability funded by all allies. To support this interim BMD capability, the United States will offer EPAA assets to the alliance as voluntary national contributions to the BMD mission, and will welcome contributions by other allies. For example, President Obama announced in Chicago that he has directed the transfer of the AN/TPY-2 radar deployed in Turkey to NATO operational control. The EPAA also includes BMD-capable Aegis ships that can perform many roles besides BMD. If conditions warrant, we will transfer BMD-capable Aegis ships to NATO operational control.

These decisions have created a framework for allies to contribute and optimize their own BMD assets for our collective defense, and the United States welcomes contributions from other allies. Several NATO allies possess land- and sea-based sensors that could be linked into the system, as well as lower tier systems that can be integrated and used to provide point defense. For example, the Netherlands has indicated that it will spend close to 250 million Euros to modify the radars on its frigates to detect and track ballistic missiles at long ranges and has indicated it will contribute its Patriot BMD systems to the NATO missile defense mission.

## *Russia*

An update on missile defense cooperation with Europe should also include a discussion of our efforts to pursue cooperation with the Russian Federation. Missile defense cooperation with Russia is a Presidential priority, as it has been for several Administrations going back to President George H.W. Bush in the early 1990s.

When President Obama announced his new vision for missile defense in Europe in September 2009, he stated that “we welcome Russia’s cooperation to bring its missile defense capabilities into a broader defense of our common strategic interests.” Missile defense cooperation with Russia will not only strengthen our bilateral and NATO-Russia relationships, but also could enhance NATO’s missile defense capabilities.



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Successful missile defense cooperation would provide concrete benefits to Russia, our NATO allies, and the United States and will strengthen – not weaken – strategic stability over the long term.

This means it is important to get the Russian Federation inside the missile defense tent now, working alongside the United States and NATO, while we are in the early stages of our efforts. Close cooperation between Russia and the United States and NATO is the best and most enduring way for Russia to gain the assurance that European missile defenses cannot and will not undermine its strategic deterrent.

Through this cooperation, Russia would see firsthand that this system is designed for the ballistic missile threat from outside the Euro-Atlantic area, and that NATO missile defense systems will not undermine Russia's strategic nuclear deterrent capabilities. Working together on missile defense would also send a strong message to proliferators that the United States, NATO, and Russia are working to counter their efforts. And in Chicago, the NATO allies in our Summit Declaration stated that "Through ongoing efforts in the NATO-Russia Council, we seek to determine how independent NATO and Russian missile defense systems can work together to enhance European security. We look forward to establishing the proposed joint NATO-Russia Missile Data Fusion Centre and the joint Planning Operations Centre to cooperate on missile defense."

That said, Russia has raised the issue of wanting a legal guarantee with a set of "military-technical criteria" that could, in effect, create limitations on our ability to develop and deploy future missile defense systems against regional ballistic missile threats such as those presented by Iran and North Korea. We have made it clear that we cannot and will not accept limitations on our ability to defend ourselves, our allies, and our partners, including where we deploy our BMD-capable Aegis ships. These are multi-mission ships that are used for a variety of purposes around the world, not just for missile defense.

While we seek to develop ways to cooperate with Russia on missile defense, it is important to remember that under the terms of Article 5 of the North Atlantic Treaty, NATO alone bears responsibility for defending the alliance from the ballistic missile threat. This is why the United States and NATO cannot agree to Russia's proposal for "sectoral" missile defense. Just as Russia must ensure the defense of Russian territory, NATO must ensure the defense of NATO territory. NATO cannot and will not outsource its Article 5 commitments.

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We would, however, be willing to agree to a political framework including a statement that our missile defenses are not directed at Russia. Any such statement would be politically binding and would publicly proclaim our intent to work together and chart the direction for cooperation.

As the NATO declaration issued at the Chicago summit stated: “We propose to develop a transparency regime based upon a regular exchange of information about the current respective missile defense capabilities of NATO and Russia. Such concrete missile defense cooperation is the best means to provide Russia with the assurances it seeks regarding NATO’s missile defense plans and capabilities. In this regard, we today reaffirm that the NATO missile defense in Europe will not undermine strategic stability. NATO missile defense is not directed against Russia and will not undermine Russia’s strategic deterrence capabilities. NATO missile defense is intended to defend against potential threats emanating from outside the Euro-Atlantic area. ”

We look forward to continuing discussions with the Russian Federation to develop a mutually agreed framework for missile defense cooperation.

## *Conclusion*

Today’s ballistic missile threats continue to increase in number and sophistication. This increasing threat reinforces the importance of our collaborative missile defense efforts with allies and partners around the world, which not only strengthen regional stability, but also provide protection for our forces serving abroad and augment the defense of the United States. At the same time we are continuing to work with Russia and appreciate the statements of President Putin, Prime Minister Medvedev, and other Russian officials that we should continue to work to find common ground to resolve our differences.

Thank you for your time and attention. I look forward to your questions.



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## Australian Researchers Make Headway on Hendra Virus Treatment

*Global Security Newswire*, 11 June 2012; <http://www.nti.org/gsn>

Australian scientists have made headway in their pursuit of an antidote to the lethal Hendra virus, and have obtained government financial support to continue their work, Griffith University announced last week.

"We have already been able to reduce Hendra virus in cells by 99.99 percent within a laboratory, and we have found the treatment is highly effective in very low doses," research team head Nigel McMillan said in provided comments.

The developmental treatment targets the virus by shutting down a critical gene. "We have also developed a novel way of delivering the therapy through what we call 'stealth liposomes,' which will safely take the treatment to where it needs to go in the body," the associate professor said.

The Hendra virus is considered a possible candidate for use as a biological weapon; the virus is transmitted from animals to humans and it kills two-thirds of those it infects, according to previous reporting. At present, there exists no viable, nondangerous treatment for the Hendra virus. An antibody countermeasure that is available is still developmental and not without negative health impacts, according to a university press release.

McMillan said his researchers are on the verge of completing work on their countermeasure. "If someone comes in who has been infected we will be able to give them a therapy which will turn off the virus and the patient will recover naturally because the virus won't have the opportunity to spread," he said, adding, "Furthermore, the patient will then develop a lifelong immunity to Hendra virus."



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## Decision on Chemical Weapons at Blue Grass Depot Awaits Year-Long Study

Greg Kocher, *The Lexington Herald-Leader* (KY), 13 June 2012; <http://www.herald-leader.com>  
"Look before you leap," the saying goes, and that applies to the proposal to explode 15,000 mustard munitions inside steel vessels at Blue Grass Army Depot.

Local officials learned Wednesday that an environmental assessment of the proposal will take about a year to complete. The assessment is required by the National Environmental Policy Act or NEPA. The 42-year-old law requires federal agencies to consider the environmental impact of their proposed actions, outline alternatives and accept public comment.

No decision on whether to explode mustard munitions will be made until the assessment is finished, said Jeff Brubaker, project manager for the plant that will destroy chemical weapons stored at the Madison County depot. Brubaker spoke at a quarterly meeting of officials to discuss issues surrounding the storage and ultimate destruction of chemical weapons.

The assessment will consider impacts of a thermal pollution-abatement system and how exhaust releases from the vessels would impact the environment. The assessment will also look into possible impacts on human health, Brubaker said.

The assessment will be conducted by Oak Ridge National Laboratory in Tennessee because that complex has the technical resources to do it, Brubaker said. Oak Ridge is known for its work in the 1940s to separate and produce uranium and plutonium for use in developing a nuclear weapon, but today the lab does all kinds of research, including for homeland security purposes. No nuclear material is stored at Blue Grass Army Depot, Brubaker said. Oak Ridge performed a similar assessment for another weapons depot in Pueblo, Colorado, where the public-comment period recently ended.

A sampling of 96 mustard rounds X-rayed last year at the Madison County depot determined that 85 percent had at least a 30 percent solidification of mustard agent, or "heel," in the projectiles. The presence of heel in the 155mm mustard shells at other facilities across the country has led to complications and delays in the destruction process because solidified agent is difficult to remove. Trying to remove that agent by hand poses a greater risk to workers than just exploding the rounds in steel vessels.

The technology to explode chemical weapons in steel vessels was used to destroy 2,700 mustard munitions in Anniston, Alabama, Brubaker said. That was the only domestic use of the technology, although it has been used by other countries.



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In other news, officials learned that total employment for the construction of the chemical weapons plant is 939 people. Of those, 863 are employed at Madison County, and another 76 are employed at sites building equipment for the Madison County plant. Those off-site locations are in San Diego; Pasco, Washington; Columbus, Ohio; and Frederick, Maryland.

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## Preparations Begin for 3rd Review Conference

*Organization for the Prohibition of Chemical Weapons, 08 June 2012; <http://www.opcw.org>*

The Open Ended Working Group (OEWG) for preparation of the Third Review Conference of the States Parties of the Chemical Weapons Convention (CWC) to review the operation of the Convention held its first meeting on June 7, 2012. The Conference will be held from April 8-19, 2013 in The Hague.

The Review Conferences of the States Parties are held every five years and the Second Conference was held in 2008. At its 68<sup>th</sup> Session in May 2012, the Organization for the Prohibition of Chemical Weapons (OPCW) Executive Council appointed an Open Ended Working Group (OEWG) with a Bureau comprising representatives from five geographic regional groups.

H.E. Nassima Baghli of Algeria (African Group) was appointed to lead the Bureau as the Chairperson and H.E. Mrs. Mary Whelan of Ireland (Western Europe and Other States Group), H.E. Mr. Kazem Gharib of the Islamic Republic of Iran (Asia Group), H.E. Mr. Roman Kolodkin of the Russian Federation (Eastern European Group), and H.E. Mr. Alvaro Moerzinger of Uruguay (Group of Latin American and Caribbean States) were appointed as Vice Chairs.

The OEWG will address all issues related to the agenda for the Conference and status of its final documents. The Group's deliberations and proceedings will be guided by the principles of consensus and broad participation of the States Parties.

In its first substantive meeting the OEWG focused on the status of implementation of universality of the Chemical Weapons Convention. The OPCW currently has 188 Member States with eight countries that have still to join, including Angola, Egypt, Israel, Myanmar, North Korea, Somalia, South Sudan and Syria.

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## Sarin Nerve Agent Destruction Wraps up at Russian Depot

*Global Security Newswire, 08 June 2012; <http://www.nti.org/gsn>*

The elimination of munitions loaded with sarin nerve agent has concluded at Russia's Shchuchye complex, though the installation continues to hold chemical-weapon materials including soman and VX, Interfax quoted a site spokesman as saying on Tuesday.

"The plant was opened three years ago, on May 29, 2009. Over this period, the facility has destroyed all stockpiles of sarin type agents, a total of 2,920,527.7 kilograms [6,438,661.4 pounds], which accounts for more than half of all stockpiled ammunition stored in Shchuchye. The total arsenal is 5,457,000 [metric tons] of toxic agents," the spokesman said.

The completion of four other Russian chemical-armorment elimination sites preceded construction of the Shchuchye dismantlement installation. Russia is to construct seven such complexes, according to earlier reporting. Moscow has said its original 40,000-metric-ton stockpile should be eliminated by 2015.

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## UN Cash Gap May Hinder its Nuclear Role

Reuters, 13 June 2012; <http://www.reuters.com>

The United Nations' nuclear agency is significantly underfunded, a think-tank said on Wednesday, warning the shortfall risked limiting its ability to identify covert atomic activity that might have a military dimension.

The report, issued by a Canadian think-tank, described the International Atomic Energy Agency (IAEA) as a "veritable bargain for international peace and security," but said the Vienna-based agency needed to be reformed and better financed. "The agency is significantly underfunded, considering its responsibilities and the expectations increasingly being placed on it," it said. [...]

Trevor Findlay, the report's author, told Reuters he was worried the funding problem would gradually affect the agency's ability to hold countries...to account. "It will not be able to develop its capacity over time for detecting undeclared nuclear activity. That to me is the most dangerous thing," he said. "The agency could just do so much more and a better and smarter job if it had extra money, in almost every single program," Findlay, a professor of Canada's Carleton University and a former Australian disarmament diplomat, added. [...]

Like other UN bodies, the IAEA's budget is not growing in real terms and, as a result, it does not possess the latest technology or have adequate staffing for its role, the report said. "Despite significant improvements to the nuclear safeguards regime, there is substantial room for improvement, especially in detecting undeclared materials, facilities and activities." [...]

### Criticism

The 142-page report, entitled "[Unleashing the Nuclear Watchdog](#)", was based on a two-year research project and was published by the Center for International Governance Innovation. It gave a largely positive assessment of the IAEA's work, but criticized its initial handling of Japan's Fukushima nuclear crisis last year, the worst accident of its kind in a quarter of a century. "For 24 hours the IAEA said nothing publicly. It apparently saw no need for an early public assessment of the situation, an urgent meeting of member states or even a press conference," it said, adding that the agency's image had been "tarnished" by its reaction. The IAEA and its Japanese director general, Yukiya Amano, defended the agency's performance during the crisis, saying it was forced to rely on information from Tokyo. [...]

However, the IAEA still expects global use of nuclear energy to rise by up to 100 percent in the next two decades. That is expected to place the agency and its inspectors under further strain,



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as some of the material and equipment used in a civil nuclear energy program can – technically – also be diverted to develop nuclear weapons. The report said the IAEA's role in nuclear safety was being enhanced after Fukushima, but remained "hobbled by member states' reluctance to commit to mandatory measures and provide adequate resources."

The bulk of funding for the IAEA – which has more than 2,300 staff and has a mandate that covers inspections as well as supporting nuclear security and peaceful use of the atom – comes from Western member states on a voluntary basis. However, a group of industrialized, mainly European states as well as Japan have resisted budget hikes for the agency at a time when government finances are reeling from debt problems.

The United States, its biggest financier, has increased contributions since President Barack Obama took office in line with his call for IAEA funds to be doubled in four years. The IAEA's regular budget for 2012 was 331.5 million Euros. Findlay said developing states such as China, India, Brazil and Russia should help out more since they have become wealthier.

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## Supercomputer Simulates Nuclear Explosion Down to the Molecular Level

*io9 Online, 06 June 2012; <http://www.io9.com>*

Treaties forbid the detonation of nuclear test weapons – which creates problems for national defense developers who need to efficiently certify the effectiveness of their arsenal. Luckily for them, a powerful new supercomputer is now able to replicate the physical impact of nuclear explosions – albeit digitally. And luckily for us, the resulting innovations may spill over to more constructive areas.

The number-crunching required to simulate an actual nuclear explosion is staggering. Computer scientists need to simulate molecular-scale reactions taking place over the course of milliseconds. To get this level of detail, researchers at Purdue and the National Nuclear Security Administration's (NNSA) Lawrence Livermore National Laboratory had to coordinate over 100,000 machines. They also had to split multiple processes in parallel on separate machines in large computer clusters.

And as any computational scientist worth his grain of salt will tell you, once you start to scale this high, you are virtually guaranteed to experience failed error detection and bottlenecks in communication and computation – and this is exactly what started to happen. Initially, the researchers discovered that natural faults in the execution environment frequently resulted in errors, resulting in corrupted memory and failed communication between machines. The challenge, therefore, was in managing the scale.

Their solution: Scalable supercomputer clustering. In their revised configuration, each machine in the supercomputer cluster contained several processors with each one running a "process" during a simulation. The researchers created an automated method for "clustering," or grouping the large number of processes into a smaller number of "equivalence classes" with similar traits. Grouping the processes into equivalence classes made it possible for them to quickly detect and pinpoint problems.

Their breakthrough marked an important step forward in the development of ultra-precise simulations. It is thought that the same simulation architecture used by these researchers could eventually be applied to such areas as climate modeling and studying the dynamic changes in a protein's shape. The findings will be presented during the Annual IEEE/IFIP International Conference on Dependable Systems and Networks from June 25-28 in Boston. Recent research findings were detailed in two papers last year, one presented during the IEEE Supercomputing Conference and the other during the International Symposium on High-Performance Parallel and Distributed Computing.



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## Two Nuclear Weapons Shipments Secured through CTR

Senator Lugar Official Website, 05 June 2012, <http://lugar.senate.gov>

Today, U.S. Senator Dick Lugar announced continued progress in Nunn-Lugar Global in April 2012:

- 1 biological threat monitoring station built and equipped;
- 2 nuclear weapons train transport shipments secured; and
- 70.08 metric tons of chemical weapons nerve agent destroyed.

On February 1, 2012, Lugar was awarded the 2012 Minute Man of the Year award by the Reserves Officer Association for his contributions to national security and U.S. military personnel. On Veteran's Day 2011, Lugar delivered a speech at Indiana University in which he called for increased efforts to stop threats of weapons of mass destruction. He heralded the future of Nunn-Lugar Global "to protect Americans at home and our service personnel overseas." "Achieving this mission requires constant vigilance. I will continue my efforts to bolster Nunn-Lugar activities that eliminate threats to U.S. security before they reach our shores," Lugar said.

The Nunn-Lugar scorecard now totals:

- 7,619 strategic nuclear warheads deactivated;
- 902 intercontinental ballistic missiles (ICBMs) destroyed;
- 498 ICBM silos eliminated;
- 191 ICBM mobile launchers destroyed;
- 155 bombers eliminated;
- 906 nuclear air-to-surface missiles (ASMs) destroyed;
- 492 SLBM launchers eliminated;
- 680 submarine launched ballistic missiles (SLBMs) eliminated;
- 33 nuclear submarines capable of launching ballistic missiles destroyed;
- 194 nuclear test tunnels eliminated;
- 2924.702 metric tons of Russian and Albanian chemical weapons agent destroyed;
- 567 nuclear weapons transport train shipments secured;
- security upgraded at 24 nuclear weapons storage sites; and
- 39 biological threat monitoring stations built and equipped.

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Perhaps most importantly, Ukraine, Kazakhstan, and Belarus are nuclear weapons free as a result of cooperative efforts under the Nunn-Lugar program. Those countries were the third, fourth and eighth largest nuclear weapons powers in the world.

Lugar makes regular oversight missions to Nunn-Lugar Global sites around the world. During his most recent mission, Lugar led a mission to East Africa to expand efforts to secure deadly biological threats.

In November 1991, Lugar (R-IN) and Sen. Sam Nunn (D-GA) authored the Nunn-Lugar Act, which established the Cooperative Threat Reduction Program. This program has provided U.S. support and expertise to help the former Soviet Union safeguard and dismantle its enormous stockpiles of nuclear, chemical and biological weapons, related materials, and delivery systems. In 2003, Congress adopted Senator Lugar's Nunn-Lugar Expansion Act, which authorized operations outside the former Soviet Union to address proliferation threats. In 2004, Nunn-Lugar funds were committed for the first time outside of the former Soviet Union to destroy chemical weapons in Albania.

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## Yury Dolgoruky Completes Initial Sea Trials

*Ria Novosti, 06 June 2012; <http://en.rian.ru>*

Russia's latest ballistic missile submarine, the Borey-class Yury Dolgoruky will complete an initial sea trial on June 7, its maker Sevmash shipyard said on Tuesday. "The Yury Dolgoruky will complete an initial sea trial on June 7. If all testing goes successfully, the boat will be accepted into service in the near future," a Sevmash source told RIA Novosti, adding that no tests of the boat's future primary armament, the Bulava ICBM, are planned during the sea trial.

The Bulava will be test-fired again this year, but from another boat of this class, the Alexander Nevsky, and if the test is successful, the two systems will be accepted into the service this year. Defense Minister Anatoly Serdyukov and former navy commander Admiral Vladimir Vysotsky have previously said that the Borey class boats and Bulava would enter service this fall.

The 24,000 ton displacement Borey class boats will carry 16 Bulava missiles. The new boats will be the mainstay of Russia's naval nuclear deterrent fleet after 2018, replacing the existing Project 941 and Project 667 (NATO Typhoon and Delta-3 and Delta-4) class ballistic missile submarines.

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