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Perfecting Detection of the Bomb

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The five-day 'Science and Technology 2015 Conference' (SnT2015), which ended Jun. 26, was the fifth in a series of multi-disciplinary conferences organised by the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), which has been based in the Austrian capital since 1997.
➲ Pages 2-3-4

CTBTO, the Nuclear Watchdog That Never Sleeps

UNITED NATIONS - The world's nuclear powers may succeed in thwarting sanctions by the Security Coun-cil or avoiding condemnation by the General Assembly, but they cannot escape the scrutiny of a key international watchdog body: the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO).
Literally, its monitoring network keeps its ear to the ground tracking down surreptitious nuclear tests – while also detecting earthquakes and volcanic eruptions in near real-time or tracking large storms and drifting icebergs."
And the network never sleeps because it has been working around the clock ever since it was installed 18 years ago – primarily to detect nuclear explosions above ground and underneath. ➲ Pages 6-7-8

World's Nuke Arsenal Declines Haltingly While Modernisation Rises Rapidly

UNITED NATIONS - The world's stockpile of nuclear weapons, held by nine states, just got a little smaller. But modernisation continues to rise rapidly, warns the Stockholm International Peace Research Institute (SIPRI) in its annual 2015 Yearbook released June 15. ➲ Pages 9-10-11

What Others Say

Where Is the UK Government's Nuclear Weapons Policy Heading?

By VARINDER SINGH BOLA | WESTMINSTER BASED THINK-TANKER
Whichever way you look at it, it seems that the fiscal hawks and disarmament doves have been blown out of the sky and have sunk into a deep blue ocean where the Trident Successor programme stares them head-on. Since returning to power with an outright majority, the UK's new Conservative government is now full steam ahead to replace the Vanguard-class submarines with a new fleet of four Successor submarines, each armed with Trident II D-5 fleet ballistic missiles. Each subma-rine will have 12 launch tubes of which 8 will be opera-tional and capable of reaching targets and delivering within a range of 11,300 km, perhaps further and even more accurate with the next generation of nuclear-tipped Trident ballistic missiles due to be in service in the early 2030s. ➲ Pages 12-13

The Ultimate Nightmare: North Korea Could Sell Saudi Arabia Nuclear Weapons

By ZACHARY KECK
One of the gravest concerns about Iran acquiring a nuclear weapon is that it will set off a nuclear arms race in the region, whereas Iran's acquisition of the bomb prompts its neighbors to follow suit. As President Obama warned in 2012, if Iran gets nuclear weapons, "It is almost certain that other players in the region would feel it necessary to get their own nuclear weapons." ➲ Pages 14-15

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By RAMESH JAURA

CTBTO Executive Secretary Lassina Zerbo introducing the panel discussion on 'Citizen Networks: The Promise of Technological Innovation' at SnT2015 in Vienna, June 2015. Photo credit: CTBTO

VIENNA (IPS) - An international conference has highlighted advances made in detecting nuclear explosions,tracking storms or clouds of volcanic ash, locating epicentres of earthquakes, monitoring the drift of huge icebergs, observing the movements of marine mammals, and detecting plane crashes.

The five-day 'Science and Technology 2015 Conference' (SnT2015), which ended Jun. 26, was the fifth in a series of multi-disciplinary conferences organised by the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), which has been based in the Austrian capital since 1997.

The conference was attended by more than 1100 scientists and other experts, policy makers and representatives of national agencies, independent academic research institutions and civil society organisations from around the world. ➲

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SnT2015 drew attention to an important finding of CTBTO sensors: the meteor that exploded over Chelyabinsk, Russia, in 2013 was the largest to hit Earth in at least a century.

Participants also heard that the Air Algérie flight between Burkina Faso and Algeria which crashed in Mali in July 2014 was detected by the CTBTO's monitoring station in Cote d'Ivoire, 960 kilometres from the impact of the aircraft.

The importance of SnT2015 lies in the fact that CTBTO is tasked with campaigning for the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which outlaws nuclear explosions by everyone, everywhere: on the Earth's surface, in the atmosphere, underwater and underground. It also aims to develop reliable tools to make sure that no nuclear explosion goes undetected.

These include seismic, hydro-acoustic, infrasound (frequencies too low to be heard by the human ear), and radionuclide sensors. Scientists and other experts demonstrated and explained in presentations and posters how the four state-of-the-art technologies work in practice.

170 seismic stations monitor shockwaves in the Earth, the vast majority of which are caused by earthquakes. But man-made explosions such as mine explosions or the announced North Korean nuclear tests in 2006, 2009 and 2013 have also been detected.

CTBTO's 11 hydro-acoustic stations "listen" for sound waves in the oceans. Sound waves from explosions can travel extremely far underwater. Sixty infrasound stations on the Earth's surface can detect ultra-low frequency sound waves that are emitted by large explosions.

CTBTO's 80 radionuclide stations measure the atmosphere for radioactive particles; 40 of them also pick up noble gas, the "smoking gun" from an underground nuclear test. Only these measurements can give a clear indication as to whether an explosion detected by the other methods was actually nuclear or not. Sixteen laboratories support radionuclide stations.

When complete, CTBTO's International Monitoring System (IMS) will consist of 337 facilities spanning the globe to monitor the planet for signs of nuclear explosions. Nearly 90 percent of the facilities are already up and running.

An important theme of the conference was performance optimisation which, according to W. Randy Bell, Director of CTBTO's International Data Centre (IDC), "will have growing relevance as we sustain and recapitalise the IMS and IDC in the year ahead."

In the past 20 years, the international community has invested more than one billion dollars in the global monitoring system whose data can be used by CTBTO member states – and not only for test ban verification purposes. All stations are connected through satellite links to the IDC in Vienna.

"Our stations do not necessarily have to be in the same country as the event, but in fact can detect events from far outside from where they are located. For example, the last DPRK (North Korean) nuclear test was picked up as far as Peru," CTBTO's Public Information Officer Thomas Mützelburg told IPS.

"Our 183 member states have access to both the raw data and the analysis results. Through their national data centres, they study both and arrive at their own conclusion as to the possible nature of events detected," he said. Scientists from Papua New Guinea and Argentina said they found the data "extremely useful".

Stressing the importance of data sharing, CTBTO Executive Secretary, Lassina Zerbo, said in an interview with Nature: "If you make your data available, you connect with the outside scientific community and you keep abreast of developments in science and technology. ➲

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Not only does it make the CTBTO more visible, it also pushes us to think outside the box. If you see that data can serve another purpose, that helps you to step back a little bit, look at the broader picture and see how you can improve your detection."

In opening remarks to the conference, Zerbo said: "You will have heard me say again and again that I am passionate about this organisation. Today I am not only passionate but very happy to see all of you who share this passion: a passion for science in the service of peace. It gives me hope for the future of our children that the best and brightest scientists of our time congregate to perfect the detection of the bomb instead of working to perfect the bomb itself."

United Nations Secretary-General Ban Ki-moon set the tone in a message to the conference when he said: "With a strong verification regime and its cutting edge technology, there is no excuse for further delaying the CTBT's entry into force."

South African Minister of Science and Technology, Naledi Pandor, pointed out that her country "is a committed and consistent supporter" of CTBTO. She added: "South Africa has been at the forefront of nuclear non-proliferation in Africa for over twenty years. We gave up our nuclear arsenal and signed the Pelindaba Treaty in 1996, which establishes Africa as a nuclear weapons-free zone, a zone that only came into force in July 2009.

Beside the presentations by scientists, discussion panels addressed topics of current special interest in the CTBT monitoring community. One alluded to the role of science in on-site inspections (OSIs), which are provided for under the Treaty after it enters into force.

This discussion benefited from the experience of the 2014 Integrated Field Exercise (IFE14) in Jordan. "IFE14 was the largest and most comprehensive such exercise so far conducted in the build-up of CTBTO's OSI capabilities," said IDC director Bell.

Participants also had an opportunity to listen to a discussion on the opportunities that new and emerging technologies can play in overcoming the challenges of nuclear security. Members of the Technology for Global Security (Tech4GS) group joined former U.S. Secretary of Defense William Perry in a panel discussion on 'Citizen Networks: the Promise of Technological Innovation'.

"We are verging on another nuclear arms race," said Perry. "I do not think that it is irreversible. This is the time to stop and reflect, debate the issue and see if there's some third choice, some alternative, between doing nothing and having a new arms race."

A feature of the conference was the CTBT Academic Forum focused on 'Strengthening the CTBT through Academic Engagement', at which Bob Frye, prestigious Emmy award-winning producer and director of documentaries and network news programme, pleaded for the need to inspire "the next generation of critical thinkers" to help usher in a world free of nuclear tests and atomic weapons of mass destruction.

The forum also provided an overview of impressive CTBT online educational resources and experiences with teaching the CTBT from the perspective of teachers and professors in Austria, Canada, China, Costa Rica, Pakistan and Russia.

With a view to bridging science and policy, the forum discussed 'technical education for policymakers and policy education for scientists' with the participation of eminent experts, including Rebecca Johnson, executive director of the Acronym Institute for Disarmament Diplomacy; Nikolai Sokov of the James Martin Center for Nonproliferation Studies; Ference Dalnoki-Veress of the Middlebury Institute for International Studies; Edward Ifft of the Center for Security Studies, Georgetown; and Matt Yedlin of the Faculty of Science at the University of British Columbia. ➲

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There was general agreement on the need to integrate technical issues of CTBT into training for diplomats and other policymakers, and increasing awareness of CTBT and broader nuclear non-proliferation and disarmament policy issues within the scientific community.

Yet another panel – comprising Jean du Preez, chief of CTBTO's external relations, protocol and international cooperation, Piece Corden of the American Association for the Advancement of Science, Thomas Blake of the Dublin Institute of Advanced Studies, and Jenifer Mackby of the Federation of American Scientists – looked ahead with a view to forging new and better links with and beyond academia, effectively engaging with the civil society, the youth and the media.

"Progress comes in increments," said one panellist, "but not by itself." (IPS | 30 June 2015) ◆

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｜２０１５年科学技術会議｜核実験探知を極める

【ウィーンIPS＝ラメシュ・ジャウラ】

ある国際会議が開かれ、核実験の探知、暴風雨や火山灰による雲の追跡、地震の震源の確定、巨大氷山の流れの監視、海洋生物の移動の観察、飛行機の墜落地点の確定能力に関する進展について話し合われた。

６月２６日まで５日間にわたって開かれた「２０１５年科学技術会議」は、オーストリアの首都ウィーンを１９９７年以来本拠としている包括的核実験禁止条約機関（CTBTO）準備委員会が主催している学際的な会議（２年に１度開催）で、今年で５回目となる。

会議には、世界各地の科学者や専門家、政策立案者、国家機関の代表、独立の学術研究機関、市民団体などから、１１００人以上が集まった。

「２０１５年科学技術会議」は、CTBTO監視ネットワークのセンサーが探知した重要な知見に着目した。つまり、２０１３年にロシア・チェリャビンスク上空で爆発した、少なくともこの１００年間で地球に落下した最大の流星のことである。

また、ブルキナファソ・アルジェリア間を飛行予定であったエア・アルジェリア航空機がマリで２０１４年７月に墜落した際に、墜落地から９６０キロも離れたコートジボワールにあるCTBTOの監視ステーションで事故が探知されたことも報告された。

「２０１５年科学技術会議」の重要性は、CTBTOが、いかなる主体であれ、地球上のどこであれ（大気圏、水中、地下）核爆発実験を行うことを違法化する包括的核実験禁止条約（CTBT）を履行させるという任務を持っているという点にある。また、核爆発実験が探知されることなく実施されることがないように信頼のおけるツールを開発するという目的も持っている。◆

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CTBTO, the Nuclear Watchdog That Never Sleeps

By THALIF DEEN

CTBTO Head Lassina Zerbo overseeing the equipment in use during the Integrated Field Exercise IFE14 in Jordan from Nov. 3 to Dec. 9, 2014. Photo Courtesy of CTBTO

UNITED NATIONS (IPS) - The world's nuclear powers may succeed in thwarting sanctions by the Security Council or avoiding condemnation by the General Assembly, but they cannot escape the scrutiny of a key international watchdog body: the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO).

Literally, its monitoring network keeps its ear to the ground tracking down surreptitious nuclear tests – while also detecting earthquakes and volcanic eruptions in near real-time or tracking large storms and drifting icebergs."

And the network never sleeps because it has been working around the clock ever since it was installed 18 years ago – primarily to detect nuclear explosions above ground and underneath. ➲

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The network is a way to guard against test ban treaty violations because the Comprehensive Nuclear-Test-Ban Treaty (CTBT) prohibits nuclear explosions worldwide: in the atmosphere, underwater and underground.

"The CTBTO's International Monitoring System has found a wider mission than its creators ever foresaw: monitoring an active and evolving Earth," Dr. Lassina Zerbo, Executive Secretary of CTBTO, told IPS.

He said some compare the system to a combined giant Earth stethoscope and sniffer that looks, listens, feels and sniffs for planetary irregularities.

It's the only global network which detects atmospheric radioactivity and sound waves which humans cannot hear, said Dr. Zerbo.

The CTBTO's global monitoring network now comprises 300 stations, some in the most remote and inaccessible areas of the Earth and sea.

The network captures four types of data: seismic (shockwaves in the earth), hydroacoustic (measuring sound through water), infrasound (low frequency sound) and radionuclide (radioactivity). It is about 90 percent complete.

When completed, the system will have 337 stations placed globally to monitor every corner of the planet effectively.

"Even before entering into force, the CTBT is saving lives," says U.N. Secretary-General Ban Ki-moon.

Currently, the network collects some 15 gigabytes of data daily, which it sends in real-time to the CTBTO's data analysis centre in Vienna, Austria.

From there, a daily analysis report is sent to the CTBTO's 183 Member States for their own use and analysis.

This universal system of looking, listening and sniffing the Earth is the work of CTBTO, which every two years hosts a scientific and technical conference.

This year's Science and Technology Conference is scheduled to take place June 22-26 at the Hofburg Palace in the Austrian capital of Vienna.

The CTBTO's monitoring network has had a superlative track record: on Feb. 12, 2013, 94 of the network's seismic monitoring stations and two of its infrasound stations detected and alerted Member States to a nuclear detonation more than an hour before North Korea announced it had conducted a test.

Three days later, on Feb. 15, 2013, the CTBTO's infrasound monitoring stations detected signals made by a meteor that had entered the atmosphere and disintegrated in the skies over Chelyabinsk, Russia.

The CTBTO network – described as the only global one of its kind to detect infrasound – recorded the shock wave caused by the exploding fireball.

That data helped scientists to locate the meteor, measure the energy release, its altitude and size.

And the system's atmospheric sampling tracked the invisible plume of radioactivity from the March 2011 Fukushima Daiichi nuclear power plant disaster, as it spread around the globe.

It showed that radioactivity outside of Japan was below harmful levels. That knowledge helped public safety officials around the world understand what course of action to take, according to CTBTO.

The monitoring network has also helped tsunami warning centres announce rapid warnings, in real time, after severe earthquakes; improved meteorological models for more accurate weather forecasting; and provided insights into volcanic eruptions. ➲

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Additionally, it has enhanced the alerts that civil aviation authorities use, in real time, to warn pilots about damaging volcanic dust; provide more precise information about climate change; increased understanding of the structure of the Earth's inner core; and followed the migratory habits and the effects of climate change on marine life.

To access the data, the CTBTO has created a Virtual Data Exploitation Centre which provides scientists and researchers from many different disciplines with data for research and enables them to publish new findings.

Rave reviews have come from several academics.

"The International Monitoring System is a fantastic tool for monitoring the planet's core, atmosphere, oceans, or environment," says Dr. Raymond Jeanloz, professor of Geophysics and Astronomy at the University of California, Berkeley.

"The CTBTO data give us a glimpse of the Earth's deep interior -what's happening there and how it evolved over Earth's history," says Professor Miaki Ishii, Department of Earth and Planetary Sciences, Harvard University.

And Randy Bell, director of the CTBTO's International Data Centre, says: "The global data are extremely valuable because they span decades, are high quality and highly calibrated. The data can be used to analyse local, regional or global events."

Bell says that his primary job is to look for nuclear tests, but allowing the data to be used for science gets more experts looking at the data.

"What may be noise to me might be a signal to someone else," he says.

Meanwhile, on a single day, the CTBTO's International Data Centre analyses over 30,000 seismic signals to identify events that meet stringent criteria.

The CTBTO says that though many countries have their own seismic monitoring systems, the CTBTO monitors are "global, permanent, calibrated and the data are shared equally."

Its seismic network has been monitoring infrasound extending all the way to sub-Saharan Africa, Eastern and Southern Africa, Indonesia and Antarctica.

The CTBTO also has a network of underground listening posts located in some of the world's most remote waters listening to earthquakes in the Andes Mountains and around the northern Pacific.

The data has been used to track the migratory habits of a particular species of Blue Whale in the Indian Ocean.

"The nations of the world have invested about one billion dollars to create The Global Ear," says Dr. Zerbo.

"Every year they continue their investment, hoping it will never have to be used for its intended purpose of detecting a violation of the Nuclear-Test-Ban Treaty. Civil and scientific spinoffs show the world immediate payback and in turn increase support for the Treaty.

"As more scientists and organisations make use of the data, the value has become ever more apparent," says Dr. Zerbo. (IPS |17 June 2015) ◆

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World's Nuke Arsenal Declines Haltingly While Modernisation Rises Rapidly

By THALIF DEEN

Every nuclear power is spending millions to upgrade their arsenals, experts say. Credit: National Nuclear Security Administration/CC-BY-ND-2.0

UNITED NATIONS (IPS) - The world's stockpile of nuclear weapons, held by nine states, just got a little smaller. But modernisation continues to rise rapidly, warns the Stockholm International Peace Research Institute (SIPRI) in its annual 2015 Yearbook released June 15.

The study said the total number of nuclear warheads in the world is declining, primarily due to the United States and Russia continuing to reduce their nuclear arsenals. "But this is at a slower pace compared with a decade ago," the Yearbook said. At the same time, both countries have "extensive and expensive" long-term modernisation programmes under way for their remaining nuclear delivery systems, warheads and production.

Currently, there are nine states—the United States, Russia, UK, France, China, India, Pakistan, Israel and North Korea – armed with approximately 15,850 nuclear weapons, of which 4,300 were deployed with operational forces. ➲

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Roughly 1,800 of these weapons are being kept in a state of high operational alert.

"Despite renewed international interest in prioritizing nuclear disarmament, the modernisation programmes under way in the nuclear weapon-possessing states suggests that none of them will give up their nuclear arsenals in the foreseeable future," says SIPRI Senior Researcher Shannon Kile.

Asked for her response, Alice Slater, New York director of the Nuclear Age Peace Foundation and who serves on the Coordinating Committee of Abolition 2000, told IPS the disheartening news from SIPRI's report is that all nine nuclear weapons states are modernising their nuclear arsenals – and particularly the five major nuclear weapons states: the United States, Russia, UK, France and China.

All five countries, she pointed out, actually pledged, in the 1970 Non-Proliferation Treaty (NPT), which was extended indefinitely in 1995, "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament".

Nevertheless, this disregard of promises given and repeated at successive five-year NPT review conferences – with the U.S., for example, projecting expenditures of one trillion dollars over the next 30 years for two new bomb factories, missiles, planes and submarines to deliver newly designed nuclear weapons – has given fresh impetus to an international campaign by non-nuclear weapons states to negotiate a treaty to ban the bomb, declaring nuclear weapons illegal and prohibited – just as the world has done for chemical and biological weapons, said Slater.

Besides the United States and Russia, SIPRI said the nuclear arsenals of the other nuclear-armed states are considerably smaller, but all are either developing or deploying new nuclear weapon systems or have announced their intention to do so.

In the case of China, this may involve a modest increase in the size of its nuclear arsenal, said SIPRI.

India and Pakistan are both expanding their nuclear weapon production capabilities and developing new missile delivery systems.

North Korea appears to be advancing its military nuclear programme, but its technical progress is difficult to assess based on open sources, according to the Yearbook.

The latest SIPRI report follows the failure of an NPT review conference in New York last month.

Tariq Rauf, SIPRI's director of the Disarmament, Arms Control and Non-Proliferation Programme, expressed disappointment over the failure of the review conference in which 161 states participated "with little to show for their effort."

He said agreement on a final document was blocked by the United States, with the support of Britain and Canada – "their reason being that they were adamantly opposed to putting pressure on Israel to attend an international conference in March 2016 to ban nuclear, biological and chemical weapons and ballistic missiles in the region of the Middle East".

Israel is the only country in the Middle East that has never joined the NPT and is reported to have nuclear weapons, he pointed out.

Other important issues discussed at the conference included the humanitarian impact of nuclear weapons (HINW), an initiative supported by 159 non-nuclear-weapon States drawing on the results of international conferences held in Oslo (2013), Nayarit (2014) and Vienna (2014) – where it was made clear that no State, no international relief organisation nor any other entity has the capacity to deal with the humanitarian, environmental, food and socio-economic consequences of a nuclear weapon detonation. ➲

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These States called for a legally-binding prohibition on nuclear weapons, such as the prohibitions on biological and chemical weapons.

The five declared nuclear-weapon States – China, France, Russia, the United Kingdom and the United States, also the veto-wielding members of the Security Council – rejected all such demands and firmly insisted that their nuclear weapons were not at any risk of accidental or deliberate detonation.

"Thus, an opportunity has been lost to push for a safer Middle East without weapons of mass destruction, and for steps leading to the global elimination of nuclear weapons – at least until the next five-yearly NPT Review Conference in held in 2020," Rauf added.

No one should take any comfort in this, neither the 192 parties to the NPT nor the non-parties, India, Israel and Pakistan, because the dangers of nuclear weapons affect everyone on this planet, said Rauf, a former senior official at the International Atomic Energy Agency (2002-2012) dealing with nuclear verification, non-proliferation and disarmament.

Slater told IPS there has been a successful series of conferences with civil society and governments over the past two years – in Norway, Mexico and Austria – to address the catastrophic humanitarian consequence of nuclear war.

At the recent NPT, which broke up in failure without a consensus document, 107 nations signed on to a humanitarian pledge, offered by Austria, to "fill the legal gap" for nuclear disarmament.

Unwilling to be held hostage to the "security" concerns of the nuclear weapons states, the non-nuclear weapons states have pledged to press forward to outlaw nuclear weapons without them.

She said South Africa was particularly eloquent, comparing the current regime of nuclear haves and have-nots to a form of "nuclear apartheid".

After the 70th anniversary of the tragic destruction of Hiroshima and Nagasaki, it is expected that negotiations will begin, she said.

While some argue that this would be ineffective without the participation of the nuclear weapons states, great pressure will be brought to bear on the "weasel" states, who mouth their fealty to nuclear disarmament, while sheltering in military alliances under the U.S. nuclear umbrella, said Slater.

Last week, the Dutch parliament, a NATO (North Atlantic Treaty Organisation) state, dependent on U.S. nuclear protection, voted to support the Humanitarian Pledge to fill the legal gap.

"One should expect more weakening of the nuclear phalanx, striding the world and holding us all hostage, as NATO states and Asian allies relying on U.S. nuclear deterrence feel the approbation of a vibrant grassroots campaign, around the world, working for a ban treaty," said Slater. (IPS | 15 June 2015) ◆

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世界の核兵器―量的削減は停滞の一方、近代化は加速

【国連IPS＝タリフ・ディーン】

「９か国が保有する世界の核兵器備蓄は、このところわずかしか減っていない。他方で核戦力の近代化は急速に進んでいる。」とストックホルム国際平和研究所（SIPRI）が１５日に発表した最新の年鑑で警告している。

同年鑑によれば、米国とロシアが継続的に核戦力を削減し続けているため、世界の核弾頭の総数自体は減少しているという。◆

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What Others Say

Where Is the UK Government's Nuclear Weapons Policy Heading?

By VARINDER SINGH BOLA | WESTMINSTER BASED THINK-TANKER

Whichever way you look at it, it seems that the fiscal hawks and disarmament doves have been blown out of the sky and have sunk into a deep blue ocean where the Trident Successor programme stares them head-on.

Since returning to power with an outright majority, the UK's new Conservative government is now full steam ahead to replace the Vanguard-class submarines with a new fleet of four Successor submarines, each armed with Trident II D-5 fleet ballistic missiles. Each submarine will have 12 launch tubes of which 8 will be operational and capable of reaching targets and delivering within a range of 11,300 km, perhaps further and even more accurate with the next generation of nuclear-tipped Trident ballistic missiles due to be in service in the early 2030s.

Building a political mandate

In what has been a complicated and long-running affair, there seems to have been little overall deviation in policy amongst the main parliamentary parties regarding the Successor programme since the process began.

In December 2006, the then Labour Government led by Prime Minister Tony Blair published a White Paper outlining its intentions to build a new class of submarines. Following the publication of the White Paper there was a vote on Trident renewal in March 2007 ("this House supports the Government's decision as set out in the white paper The Future of the United Kingdom's Nuclear Deterrent (CM6994) to take the steps necessary to maintain the UK minimum strategic nuclear deterrent beyond the life of the existing system and to take further steps towards meeting the UK's disarmament responsibilities under Article VI of the Non-proliferation treaty"). Note the attempt to balance out renewal with a commitment to re-energise the diplomatic track to multilateral disarmament. This was followed by studies on both the steps towards a world free of nuclear weapons, and concrete disarmament verification procedures, and by setting up the P5 process.

The Trident Alternatives Review (TAR) was commissioned in 2010 by the last Liberal Democrat and Conservative Party Coalition Government soon after it came to power, at the same time as a decision to delay the Main Gate to 2016 for an in-service date for the first Successor submarine in 2028. The review highlighted a number of drawbacks inherent in nuclear alternatives to the Trident ballistic missile submarine system and claimed that they were all more expensive when judged against a set of criteria. It received heavy criticism from civil society for being flawed on its assumptions and conclusions. In its most recent vote on the issue in January 2015, Parliament voted against the motion 'this House believes that Trident should not be renewed'. A further parliamentary debate is expected ahead of the 'Main Gate' decision next year.

This positioning on Trident reflects the wish of much of the Westminster political leadership to be seen as being 'strong on defence' and upholding UK influence on the global stage. Whilst the Scottish National Party now fields a strong and noticeable representation in the Westminster Parliament, they will be unable to turn the political tide against the renewal of another generation of ballistic missile submarines.

The lack of appetite of the Conservative and Labour parties to contemplate a move away from a 'minimum, credible, independent nuclear capability, delivered through a Continuous At-Sea Deterrent' translates to an effective certainty of Parliamentary support for the Main Gate decision due in 2016.

The government has not been shy of reminding fellow parliamentarians of the 2015 Conservative Party manifesto, and therefore electoral mandate, which in the section 'Keeping Britain safe' on nuclear weapons policy specifically states: 'We will retain the Trident continuous at sea nuclear deterrent to provide the ultimate guarantee of our safety and build the new fleet of four Successor Ballistic Missile Submarines - securing thousands of highly-skilled engineering jobs in the UK.' ➲

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Whilst the 2006 White Paper envisioned the final 'Main Gate' decision on whether three or four boats are needed to maintain Contentious At-Sea Deterrence (CASD) to be taken when more is known about the design including when further information on the reliability and maintenance requirements of the new submarine design becomes available, the government has made it clear that it does not intend to conduct a review on a change of operational posture in the foreseeable future. It has been the policy of previous governments that the UK would consider such a move in an improved security environment as part of a multilateral package. This current government clearly is not considering such a possibility.

The document also states: 'Later this year, we will hold a National Security Strategy and Strategic Defence and Security Review to plan for the future.' Whilst some had pinned their hopes of Trident being included in the Strategic Defence and Security Review (SDSR), it has been confirmed that it will not be revisited in the forthcoming Strategic Defence and Security Review.

The Succesor submarines will be solely funded out of the defence budget. The projected expenditure on Trident is expected to account for one third of the defence procurement budget over well over a decade. An update to parliament in November 2014 stated that £2,068 million had been spent on the replacement for the Vanguard Class submarine up to 31 March 2014, broadly within the expected spend. Updated figures will be published in the Ministry of Defence's Annual Reports and Accounts.

What next?

Whilst the UK has reduced the number of warheads in its nuclear arsenal and its readiness, successive governments have failed to develop a stronger narrative on the UK's commitment to non-proliferation and achieving 'Global Zero'. The P5 process appears stuck in the early stages of dialogue with little tangible to show, and recent setbacks in terms of shared understanding around what it means to be a responsible nuclear armed state in the 21st century.

It is deeply unfortunate that the Trident renewal process is passing through its most controversial stage just as the Nuclear Non-Proliferation Treaty (NPT) is at its weakest point for a decade. When faced with the choice of either joining the rest of the international community in putting pressure on Israel to engage more seriously in the process to set up a WMD Free Zone in the Middle East, or blocking consensus on a final agreement for the NPT Review Conference, the UK sided with the US and Canada to block agreement. Having done this it is essential that the UK lead in proposing realistic and attractive initiatives to get both the WMD Free Zone process and the broader NPT agenda back on track.

When renewing Trident it is essential the government acknowledge its international responsibilities to go beyond talking of its desire to see progress on multilateral disarmament and propose concrete measures. The government must start to develop a globally cooperative approach that undercuts the drivers of proliferation and reduces the salience nuclear weapons have to all states. This consideration needs to be expedited to the top of the foreign policy agenda.

Parliamentarians and security strategists should also comprehensively test currently held assumptions including the assumption that submarines will be able to remain undetectable in the future. The technical game of cat and mouse in the oceans is rapidly changing with the investment and deployment of ever more sophisticated anti-submarine warfare (ASW) detection technologies (hunter-killer, aircraft, satellites, underwater-drones and sensors networks). Recently, during NATO's annual anti-submarine warfare exercise codenamed Dynamic Mongoose, a NATO scientist went on record to say:

"...I think now miniaturising the technology that the submarine is deploying, miniaturising the sensors and having large numbers of sensors, we can start to own the underwater battle space in a way that makes it less attractive and takes away the tactical strategic advantage of the submarine."

Factor in the advancement of Unmanned Underwater Vehicles (UUVs) with the messages coming from research laboratories and we might be on the cusp of a game changer. (Huffpost Blog | 30 June 2015) ◆

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What Others Say

The Ultimate Nightmare: North Korea Could Sell Saudi Arabia Nuclear Weapons

By ZACHARY KECK

One of the gravest concerns about Iran acquiring a nuclear weapon is that it will set off a nuclear arms race in the region, whereas Iran's acquisition of the bomb prompts its neighbors to follow suit. As President Obama warned in 2012, if Iran gets nuclear weapons, "It is almost certain that other players in the region would feel it necessary to get their own nuclear weapons."

No country is seen as more likely to go nuclear in response to Iran doing so as Saudi Arabia, Iran's long-standing rival in the region. Saudi officials have done little to tamp down such fears, instead indulging them repeatedly. Just last month, Prince Turki bin Faisal, Saudi Arabia's former intelligence chief, told a South Korean conference: "Whatever the Iranians have, we will have, too."

With a few exceptions, nearly everyone who fears that Saudi Arabia will acquire a nuclear weapon nonetheless concedes Riyadh wouldn't build a bomb itself. Instead, the general consensus has long held that Saudi Arabia would purchase off-the-shelf nuclear weapons from Pakistan. Indeed, concerns about a secret Saudi-Pakistani nuclear pact date back to the 1970s and 1980s, and have become especially prevalent over the past decade and a half.

As I and others have long argued, this notion is far-fetched. While Saudi Arabia would want to buy a nuclear arsenal from Pakistan, Islamabad has no reason to sell nuclear weapons to Riyadh.

To begin with, Pakistan already worries that its arsenal is too small to survive an Indian or American counterforce strike. Moreover, selling Saudi Arabia nuclear weapons would result in unprecedented backlash from most of the international community, including both the United States and China, Pakistan's major patrons. It would also enrage Iran, who is well positioned to retaliate against Pakistan in numerous ways, from supporting separatists in Balochistan to further cozying up to India.

Any remaining concerns about whether Pakistan would sell Saudi Arabia nuclear weapons were seeming put to rest back in April, when Islamabad refused to participate in the Saudi-led military campaign in Yemen. If Pakistan refused to send in even a symbolic contingent of troops to participate in the Saudi-led mission, it certainly wouldn't give Riyadh its most valuable military assets.

But while Saudi Arabia couldn't purchase a nuclear weapon from Pakistan, it might have more luck with North Korea. In fact, there are a number of compelling reasons to believe North Korea might be amenable to such a request.

Most obviously, North Korea has a troubling history of proliferating nuclear technology, including to the Middle East. There have long been persistent (albeit largely unconfirmed) rumors that North Korea has provided Iran with nuclear technology, and Pyongyang also helped Syria build a nuclear reactor (which Israel destroyed in airstrikes in 2011). More generally, North Korea has a long track record of selling advanced military technology like ballistic missiles to numerous pariah nations.

Moreover, Saudi Arabia would be an extremely valuable patron for North Korea. Currently, Kim Jong-un is trying to improve the economy especially for North Korean elites in order to shore up support for his rule. This effort has been made extremely difficult by the more hardline stance China has taken against North Korea ever since Xi Jinping came to power in 2012.

Pyongyang has been scrambling to find suitable replacements for China, but so far it has had little luck. Russia appears to want to improve ties with North Korea, but its growing financial woes will limit its ability to provide North Korea with enough economic assistance to offset the loss of Chinese aid. ➲

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Meanwhile, South Korea appears intent on limiting its economic relationship with North Korea absent significant concessions from Pyongyang on the latter's nuclear program.

Saudi Arabia would face none of these constraints. Unlike South Korea, Saudi Arabia is not overtly threatened by North Korea's nuclear program. And unlike Russia, it does not face enormous financial difficulties.

In fact, Saudi Arabia is awash in petrodollars, boasting the third largest foreign currency reserves in the world after only China and Japan. Although it has been using these to soften the impact of lower oil prices, it still has $708 billion in FX reserves, more than enough to provide significant support for North Korea.

Saudi Arabia could also provide North Korea with other kinds of valuable assistance. For instance, foreign workers make up over half of Saudi Arabia's labor force, and North Koreans working in Saudi Arabia could provide the Hermit Kingdom with another significant source of hard currency. Indeed, this is one of the Kim regime's favorite tactics for skirting international sanctions. As the Asan Institute of Policy Studies has explained: "Earnings are not sent back as remittances, but appropriated by the state and transferred back to the country in the form of bulk cash, in clear violation on UN sanctions."

Some estimate that as many as 65,000 North Koreans are working abroad in 40 different countries, and that this number has doubled or even tripled since Kim Jong-un took power. Yet, according to Asan, Saudi Arabia doesn't even rank in the top ten nations in terms of North Korean laborers. Changing that would be a huge boon to the Kim regime.

Finally, besides hard cash, North Korea faces a chronic energy shortage, with China accounting for nearly 90 percent of North Korea's energy imports in recent years. Saudi oil and natural gas could significantly reduce North Korea's reliance on China for its energy needs, while also helping to stimulate the North Korean economy.

All of this suggests that if Saudi Arabia purchases off-the-shelf nuclear weapons, they are more likely to come from North Korea than Pakistan.

Zachary Keck is the managing editor of The National Interest. *You can find him on Twitter:* @ZacharyKeck. (The National Interest | 22 June 2015) ◆

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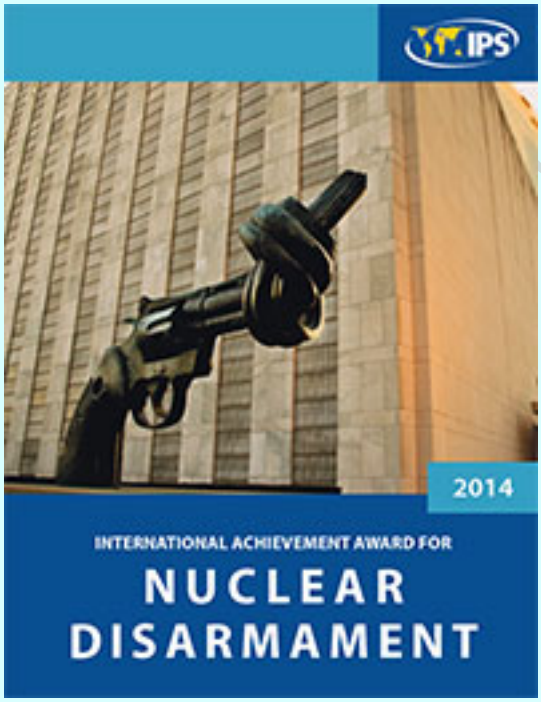

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