



SIPRI YEARBOOK 2010— NUCLEAR ARMS CONTROL, DISARMAMENT AND NON-PROLIFERATION

The past year saw some promising developments on the arms control and disarmament front. In April President Barack Obama’s speech in Prague set forth a firm US commitment to advance towards a world free of nuclear weapons. This set the tone for progress in Russian–US negotiations for further reductions in their arsenals of strategic nuclear weapons. It was reinforced by the landmark adoption by the UN Security Council, with 14 heads of state and government at the table, of Resolution 1887 in September 2009. The resolution reaffirmed the support of the Security Council for the goals of the 1968 Non-Proliferation Treaty (NPT), including nuclear disarmament and strengthening of the NPT regime, and urged action to reduce the threat of nuclear terrorism.

The year also saw setbacks on the arms control and disarmament front. The Democratic People’s Republic of Korea (DPRK, or North Korea) announced that it would not return to the suspended Six-Party Talks and would restart the production of plutonium for nuclear weapons that been halted as part of a 2007 denuclearization agreement. In May North Korea carried out a second nuclear test explosion. Concerns intensified throughout the year about the scope and nature of Iran’s nuclear programme, especially in light of revelations in 2009 that the country was building a previously undeclared uranium enrichment plant, housed in an Islamic Revolutionary Guard Corps base near the city of Qom.

In this cross-cutting background material for media, SIPRI offers several aspects of the SIPRI Yearbook dealing with nuclear issues from various perspectives.

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A world without nuclear weapons: fantasy or necessity?

■ James E. Goodby, from Chapter 1, 'A WORLD WITHOUT NUCLEAR WEAPONS: FANTASY OR NECESSITY?'

Russia and the United States have sharply reduced their arsenals of nuclear weapons. The process began under Soviet leader Mikhail Gorbachev and US President Ronald Reagan in the 1980s. It continues under Russian President Dmitry Medvedev and US President Barack Obama in 2010. Will it proceed further, perhaps all the way to zero? Both presidents say they favour a world without nuclear weapons. Many analysts have shown how Russia and the USA could reduce nuclear warheads to a thousand or so each, while limiting their associated delivery vehicles to a few hundred for each country. Several recent studies have gone still further by identifying steps that would include not only Russia and the USA but also all other states that currently possess nuclear weapons. The end state that these studies envisage is zero nuclear weapons, or close to it.

These hypothetical models are useful for analytical purposes if for no other reason than to identify the practical problems that will have to be confronted in a global enterprise to eliminate all nuclear weapons. Nuclear deterrence has become a seemingly indispensable component of relations between states. If all the world's nuclear-armed states believe that their interests will be served by eliminating nuclear weapons, then the process will gain traction. However, a single hold out could block the whole process.

One barrier to rapid, sustained Russian–US reductions in nuclear weaponry is the nuclear weapon programmes of other countries. The days when the interests of two superpowers dominated the world's strategic nuclear agenda are over. As Russian and US nuclear forces are reduced, other countries' nuclear arsenals will loom larger in security calculations. Regional conflicts also generate their own sets of impulses that affect nuclear decisions.

A wide array of actions is available to other nuclear-armed states and many of these could be pursued without delay. Those states that possess nuclear weapons should adopt a verifiable and politically binding agreement in which they would declare that: 'fissile materials removed from nuclear weapons being eliminated and excess to national security requirements will not be used to manufacture nuclear weapons; no newly produced fissile materials will be used in nuclear weapons; and fissile materials from or within civil nuclear programmes will not be used to manufacture nuclear weapons'. This language appears in a declaration issued by Russian President Boris Yeltsin and US President Bill Clinton in 1995.

Early agreement on these points by all states that possess nuclear weapons would be a powerful signal that they are determined to create the conditions for a world without nuclear weapons. Other near-term measures include:



- (a) establishing more nuclear weapon-free zones;*
- (b) exchanging data on all nuclear programmes and holdings of fissile materials;*
- (c) carrying out unilateral or parallel reductions in nuclear weapons;*
- (d) making all uranium enrichment programmes multilateral;*
- (e) placing all spent nuclear fuel elements in internationally supervised interim storage sites; and*
- (f) working to reduce regional tensions that drive nuclear weapon programmes.*

There are two categories of supporting agreements that should be in force before and after the goal of eliminating nuclear weapons has been achieved. The first category consists of nuclear-related agreements that will form the essential building blocks of a world without nuclear weapons. The second category are those non-nuclear agreements necessary to forestall conflict and the resort to force by any means, such as confidence-building measures (CBMs) and constraints on conventional, biological and chemical weapons.

Nuclear-related agreements include the 1996 Comprehensive Nuclear-Test-Ban Treaty (CTBT), a fissile material cut-off treaty (FMCT) and measures to regulate uranium enrichment and plutonium separation. Agreements that would strengthen the infrastructure of nuclear non-proliferation will also be necessary. These would include strengthening the International Atomic Energy Agency (IAEA), monitoring compliance with the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT) and enforcing measures to disrupt illicit trafficking in fissile materials.

World nuclear forces

■ Shannon N. Kile, Vitaly Fedchenko, Bharath Gopaldaswamy and Hans M. Kristensen, from Chapter 8, 'WORLD NUCLEAR FORCES'

At the start of 2010 eight nuclear weapon states possessed approximately 7500 operational nuclear weapons. Nearly 2000 of these are kept in a state of high operational alert. If all nuclear warheads are counted—operational warheads, spares, those in both active and inactive storage, and intact warheads scheduled for dismantlement—the United States, the Russian Federation, the United Kingdom, France, China, India, Pakistan and Israel together possess a total of more than 22 000 warheads. All five legally recognized nuclear weapon states, as defined by the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (Non-Proliferation Treaty, NPT)—the USA, Russia, the UK, France and China—appear determined to retain their nuclear arsenals for the indefinite future and are either modernizing or about to modernize their nuclear forces.

At the same time, Russia and the USA are in the process of reducing their operational nuclear forces from cold war levels as a result of two bilateral treaties—the 1991 Treaty on the Reduction and Limitation of Strategic Offensive Arms (START Treaty) and the 2002



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Treaty on Strategic Offensive Reductions (SORT). The nuclear arsenals of the other three nuclear weapon states are considerably smaller, but all three states are either deploying new weapons or have announced their intention to do so. There are three de facto nuclear weapon states that have never been party to the NPT—India, Pakistan and Israel. India and Pakistan are expanding their nuclear strike capabilities, while Israel appears to be waiting to see how the situation in Iran develops. North Korea conducted a second nuclear test explosion in 2009 but there is no public information to verify that it has operational nuclear weapons.

Nuclear arms control and non-proliferation

■ Shannon N. Kile, from Chapter 9, 'NUCLEAR ARMS CONTROL AND NON-PROLIFERATION'

In 2009 the controversy over the scope and nature of Iran's nuclear activities intensified with the revelation that Iran was building a previously undeclared uranium enrichment plant. In September Iran sent a letter to the IAEA Director General, Mohamed ElBaradei, informing the agency that Iran was building a second pilot enrichment facility, in addition to the one located at Natanz, to produce low-enriched uranium (LEU) for use as nuclear fuel.

The letter was sent to the IAEA shortly before US President Barack Obama, French President Nicolas Sarkozy and British Prime Minister Gordon Brown convened a joint press conference to announce that Iran was building an undeclared enrichment plant and that that their countries had been aware of the site for some time. According to US officials, the plant, called the Fordow Fuel Enrichment Plant (FFEP) by the IAEA, was located in an underground tunnel complex in the grounds of an Islamic Revolutionary Guards Corps base near the city of Qom.

They expressed concern that the plant's size, configuration and location indicated that it might be used to produce highly enriched uranium (HEU) for a suspected nuclear weapon programme. According to US officials, when fully operational the FFEP would have the capacity to produce enough HEU for 'one or two' nuclear weapons per year. The plant's discovery also raised new suspicions about the possible existence of other undeclared nuclear facilities that were not subject to IAEA safeguards inspections. Iran denied that the FFEP was part of a covert nuclear weapon programme. In a letter to the Agency in October Iran stated that the decision to build the plant came 'as a result of the augmentation of threats of military attacks against Iran'—an allusion to past Israeli and US statements that the use of force against Iran's nuclear programme could not be ruled out. The letter stated that the Fordow site had been 'allocated' to the Atomic Energy Organization of Iran (AEOI) in the second half of 2007 and construction had begun at that time; the FFEP was scheduled to become operational in 2011.



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In November the IAEA Board of Governors adopted a resolution that criticized Iran for not fulfilling its safeguards obligations and not complying with previous demands by the Board and the UN Security Council that it suspend all enrichment-related activities. The resolution called on Iran to halt construction of the FFEP plant and to confirm that it was not building any other nuclear facility previously not declared to the Agency. The resolution also urged Iran to cooperate proactively with the Agency in resolving a number of outstanding questions about its nuclear programme, in particular about allegations that Iran had carried out studies related to certain aspects of nuclear weapon design.

Coinciding with the controversy over the plant at Fordow, in October Iran and the P5+1 states (the five permanent members of the UN Security Council—China, France, Russia, the UK and the USA—plus Germany) resumed negotiations, for the first time in more than a year, on the future of Iran's nuclear programme.

The talks appeared to achieve a breakthrough when the parties announced that they had reached an agreement in principle on a nuclear fuel supply deal: Iran would send 1200 kilograms of LEU—approximately 75 per cent of its total inventory of domestically produced LEU—to Russia for further enrichment. France would then fabricate the Iranian LEU or Russian-origin enriched uranium into fuel for the Tehran Research Reactor (TRR). That reactor was expected to run out of LEU fuel in 2010—a prospect that reportedly prompted Iran during the summer of 2009 to seek assistance in refuelling it. Western countries greeted the P5+1 proposal as a useful confidence-building measure, since it would require Iran to ship most of its declared LEU stockpile out of the country by the end of 2009. The material would be returned to Iran in the form of fuel plates, usable in the TRR but difficult to convert to weapon use. However, the deal between Iran and the P5+1 collapsed in November when Iran announced that it was not willing to send LEU abroad before the fuel intended for the TRR arrived in the country; Iran would consider instead a 'simultaneous exchange' on Iranian territory. The new offer was dismissed by France, Germany and the UK (the 'European Union three', EU-3) and the USA as undermining the basic purpose of the original deal: namely, to bring Iran's stockpile of LEU below the level required to construct a nuclear weapon.

The year ended without a fuel supply deal for the TRR. The breakdown of the talks led the USA to call for a tougher international approach to Iran, including the adoption of robust new sanctions.

North Korea's nuclear programme

The year 2009 opened with the Six-Party Talks stalemated over reviving a denuclearization plan for North Korea that had been agreed by the parties in 2007. The plan set out was intended to pave the way for North Korea to verifiably 'abandon' its nuclear programme.



The prospects for reviving the stalled talks deteriorated when, in April, the UN Security Council unanimously adopted a presidential statement condemning a North Korea's test-flight of a long-range rocket. In response to the Security Council's action North Korea announced that it would no longer participate in the Six-Party Talks and would not be bound by any agreements previously reached in the talks. It also announced that it would restart the production of plutonium for nuclear weapons that been halted as part of the 2007 denuclearization agreement and would take measures to restore the nuclear facilities at Yongbyon which had been disabled according to the agreement. North Korea later acknowledged for the first time that it had been developing experimental uranium enrichment technology, ostensibly for producing nuclear fuel for a future light-water reactor, and would begin to enrich uranium.

In May 2009 North Korea's news agency reported that, for the second time, an underground nuclear test explosion had been carried out. The previous North Korean test in October 2006 was widely considered to have been a failure because of its unexpectedly low explosive yield. In response to the nuclear test, the UN Security Council unanimously approved Resolution 1874. In addition to imposing new financial sanctions on North Korea, the resolution called on UN member states to cooperate with the inspection of cargo travelling to and from North Korea.

The year ended with signs of a cautious improvement in the bilateral relations between North Korea and the USA. These included the first visit to Pyongyang by Stephen Bosworth, the US special envoy to North Korea in December. Prior to Bosworth' visit, North Korea's leader had reportedly indicated that the country would be prepared to return to the Six-Party Talks if it could first make progress in bilateral negotiations with the USA.

Proliferation concerns in Syria and Myanmar

Syria

In 2009 little progress was made in resolving the outstanding issues arising from the IAEA's investigation of a suspected undeclared nuclear facility located at al-Kibar, in eastern Syria. The site was destroyed by an Israeli air strike in September 2007. The Israeli and US governments have alleged that Syria had been secretly constructing, with technical assistance from North Korea, a nuclear reactor said to be similar to the reactor that North Korea used to produce plutonium for a nuclear explosive device. The Syrian Government has stated that the destroyed building was a disused military facility that had no connection to nuclear activities.

In November the IAEA's Director General, Mohamed ElBaradei, reported to the Board of Governors that Syria continued to withhold the cooperation necessary for the agency to be able to confirm Syria's statements about the non-nuclear nature of the al-Kibar site. Among



other shortcomings, Syria had declined to provide information about its procurement of material and equipment that the IAEA believed could be used for building a reactor. Syria also continued to deny inspectors access to three other locations that were suspected of having a ‘functional relationship’ to the activities at al-Kibar.

Myanmar

In August 2009 an Australian newspaper reported that Myanmar was engaged in clandestine nuclear collaboration with North Korea. Dissident groups had previously made claims about covert nuclear sites in Myanmar, including reactors, uranium mines and mills. The Australian story reports the construction of a secret nuclear reactor and plutonium reprocessing facility in caves at Naung Laing in the northern part of the country. However, during the autumn of 2009 doubts arose about the report. According to one authoritative source, the IAEA had concluded that the suspect site was not a nuclear reactor but rather a non-nuclear industrial workshop or machinery plant. This conclusion was based on the absence of certain ‘overhead signatures’ for a reactor in satellite imagery and on ‘specific information derived from first-hand knowledge of the site and its activities’.

New nuclear weapon-free zones

Regional arrangements establishing nuclear weapon-free zones (NWFZs) are important legal components of the global nuclear non-proliferation regime and supplement international efforts to prevent the emergence of new nuclear weapon states. In 2009 treaties establishing new NWFZs in Central Asia and in Africa entered into force. The Central Asian nuclear weapon-free zone The Treaty on a Nuclear-Weapon-Free Zone in Central Asia (Treaty of Semipalatinsk) entered into force on 21 March 2009 after the final state party, Kazakhstan, deposited its instrument of ratification. In 1997 the leaders of the five Central Asian states—Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan—issued the Almaty Declaration, calling for the creation of a Central Asian nuclear-weapon-free zone. The treaty opened for signature in September 2006.

The treaty’s provisions are similar to those of other NWFZ agreements and oblige the parties not to conduct research on, develop, manufacture, stockpile or otherwise possess nuclear weapons and not to allow the use of their territory for the stationing of nuclear weapons. It has several distinctive features as well. It is the first treaty to oblige the parties to conclude an Additional Protocol agreement with the IAEA and to follow the restrictions of the Comprehensive Nuclear-Test-Ban Treaty (CTBT), which has yet to come into force. It also requires the parties to apply measures of physical protection to nuclear material and nuclear facilities on their territories in order to meet international standards—a reflection of concerns that Central Asia could become a source or transit corridor for the smuggling of nuclear materials.



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It also commits the parties to work to reverse environmental damage caused by the production and testing of former Soviet nuclear weapons in the region. The protocol to the treaty that provides for negative security assurances to the parties from the five legally recognized nuclear weapon states had not been signed by any of these states as of 1 January 2010. China and Russia have supported adoption of the protocol, while France, the UK and the USA have expressed misgivings about it. The main concern of the latter three governments has been that the treaty's language could be interpreted as allowing Russia to deploy nuclear weapons in the zone under certain circumstances, in accordance with the provisions of a prior defence agreement, the 1992 Treaty on Collective Security.

The African nuclear weapon-free zone The Treaty of Pelindaba, establishing an African NWFZ, entered into force on 15 July 2009, after Burundi became the 28th state signatory to ratify it. The treaty, named after the former South African nuclear weapon facility near Pretoria, opened for signature in Cairo in 1996. Its entry into force marked the culmination of over 40 years of activity within the African Union (AU) as well as the expansion of NWFZs to the entire southern hemisphere. The treaty covers Africa, island state members of the AU and island territories considered by the AU to be part of Africa. In addition to containing provisions similar to those of other NWFZ agreements, the treaty provides for the parties to engage in peaceful nuclear activities while obliging them to conclude comprehensive safeguards agreements with the IAEA. The treaty also provides for the five legally recognized nuclear weapon states to give negative security assurances to the parties (Protocol I) and to pledge not to test or assist the testing of nuclear weapons within the zone (Protocol II).

The entry into force of the Treaty of Pelindaba focused renewed attention on the dispute over whether the Africa NWFZ applies to the Indian Ocean island of Diego Garcia in the Chagos Archipelago. The AU considers Diego Garcia and the surrounding islands to be part of Mauritius, an AU member state, and hence part of the African zone. However, the UK—which regards Diego Garcia, over which it exercises sovereignty, as part of the British Indian Ocean Territory—does not. Under a series of bilateral agreements with the UK, the USA has built large naval and air installations on the island that support deployments of nuclear capable attack submarines and long-range bombers. The USA has declared that neither the treaty nor protocols I and II apply to the activities on Diego Garcia of the USA, the UK or any other state not party to the treaty.

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