Pakistan
Zia Mian

Pakistan has been rapidly developing and expanding its nuclear arsenal since its nuclear weapon tests in May 1998. It is moving from an arsenal initially based on simple highly enriched uranium (HEU) fission weapons to greater reliance on lighter and more compact plutonium weapons. This has been made possible by the construction over the past fifteen years of three additional plutonium production reactors, all of which appear to be operational as of early 2015. To support this build-up, Pakistan has been blocking the start of talks at the United Nations Conference on Disarmament on an international treaty that would ban the production for weapons of HEU and plutonium – the key ingredients in nuclear weapons.

Pakistan is moving from aircraft-delivered nuclear bombs to ballistic missiles and also to ground-launched, air-launched, and possibly sea-based cruise missiles that can carry nuclear warheads. It is testing a battlefield missile system that is claimed to be nuclear-capable. Pakistan’s arsenal is expected to continue to grow in size, with warheads moving to greater states of readiness as command and control systems are seen as more reliable.

The lack of official information makes estimates of Pakistan’s spending on its nuclear weapons programme highly uncertain, but this cost is likely not a large share of its overall military spending. Pakistan’s military spending is subsidized by large amounts of military aid from the United States and subsidized arms sales from China. To help it meet basic social and economic development needs, Pakistan receives large amounts of international aid and loans for budgetary support.

Status of Pakistan’s nuclear forces

As of the end of 2014, Pakistan was believed to have on the order of 130 nuclear weapons, an almost ten-fold increase from the year 2000. The US government estimated in 2011 that Pakistan’s stockpile may have been in the range of 90 to over 110 weapons. The growth of the arsenal appears to have been steady for most of the past decade (see Table 1) but it may begin to increase at a faster rate in coming years as additional plutonium becomes available from the production reactors that came online in 2013 and 2014 and new delivery systems move from development to deployment.

There is little reliable information on the yields of Pakistan’s nuclear weapons. The number and yields of the nuclear weapon tests carried out on 28 and 30 May 1998 are disputed, with Pakistan initially claiming six tests with some having explosive yields of tens of kilotons, while independent seismologists found evidence supporting a smaller number of tests and total yields of about 10 kt and 5 kt for the tests on 28 May and 30 May respectively. A semi-official account claims that in 1998 “only two bombs were selected for tests” and another four designs were tested without fissile material.

There is little known about Pakistan’s weapon designs, although Pakistan is believed to have received in the early 1980s a first generation Chinese weapon design that used HEU. If two weapons were tested in 1998, one may have used HEU and the other plutonium for the shell of fissile material (known as a ‘pit’) that undergoes the explosive nuclear chain reaction, or possibly a combination of both in a ‘composite’ pit. Pakistan may also have developed ‘boosted’ weapons, in which tritium gas is injected into the pit just before it explodes to increase the fraction of the fissile material that undergoes fission and so significantly increase the explosive yield of the nuclear weapon.

Pakistan is not believed to have thermonuclear weapons, although Pakistani nuclear weapon scientists claim they could develop such weapons if tasked and funded to do so. This would most likely require additional nuclear weapon tests. After its tests in 1998, Pakistan declared a moratorium on nuclear testing, following a similar declaration by India.

Table 1: Estimated number of weapons in Pakistan’s nuclear arsenal, 2000-2014

<table>
<thead>
<tr>
<th>Year</th>
<th>00</th>
<th>01</th>
<th>02</th>
<th>03</th>
<th>04</th>
<th>05</th>
<th>06</th>
<th>07</th>
<th>08</th>
<th>09</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weapons</td>
<td>14</td>
<td>20</td>
<td>26</td>
<td>32</td>
<td>38</td>
<td>44</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
<td>110</td>
<td>120</td>
<td>130</td>
</tr>
</tbody>
</table>

Delivery systems

Pakistan is developing various road-mobile ballistic missile systems and ground-launched, air-launched and possibly sea-based cruise missiles to carry its nuclear weapons. These missiles are at various stages in their development and it unclear which systems will eventually be deployed (Table 2).

Table 2: Pakistan’s nuclear weapon delivery systems, 2014

<table>
<thead>
<tr>
<th>DELIVERY SYSTEM</th>
<th>RANGE (KM)</th>
<th>DEPLOYMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AIRCRAFT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aircraft F-16A/B</td>
<td>1,600</td>
<td>1998</td>
</tr>
<tr>
<td>Mirage V</td>
<td>2,100</td>
<td>1998</td>
</tr>
<tr>
<td><strong>AIRCRAFT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abdali (Hatf-2)</td>
<td>180</td>
<td>(R&amp;D)</td>
</tr>
<tr>
<td>Ghaznavi (Hatf-3)</td>
<td>400</td>
<td>2004</td>
</tr>
<tr>
<td>Shaheen-1 (Hatf-4)</td>
<td>750</td>
<td>2003</td>
</tr>
<tr>
<td>Shaheen-1A (Hatf-4)</td>
<td>900</td>
<td>(R&amp;D)</td>
</tr>
<tr>
<td>Ghauri (Hatf-5)</td>
<td>1200</td>
<td>2003</td>
</tr>
<tr>
<td>Shaheen-2 (Hatf-6)</td>
<td>2000</td>
<td>(R&amp;D)</td>
</tr>
<tr>
<td>Nasr (Hatf-9)</td>
<td>60</td>
<td>(2014)</td>
</tr>
<tr>
<td><strong>CRUISE MISSILES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Babur (Hatf-7)</td>
<td>350-750</td>
<td>(R&amp;D)</td>
</tr>
<tr>
<td>Ra’ad (Hatf-8)</td>
<td>350</td>
<td>(R&amp;D)</td>
</tr>
</tbody>
</table>


Pakistan is believed to rely on US supplied F-16 fighter jets to deliver nuclear bombs and French supplied Mirage jets to deliver both bombs and the Ra’ad air-launched nuclear-armed cruise missile. It is unclear if the JF-17 jets that Pakistan recently acquired from China also will carry the Ra’ad cruise missile.9 Pakistan has received assistance from the Democratic People’s Republic of Korea (DPRK) and especially from China with its missile programme. The reliability of Pakistan’s missiles is uncertain. In January 2003, the liquid-fueled Ghauri missile (sometimes called Hatf V) was formally inducted into the army. It is believed to be derived from the DPRK’s No-Dong missile. Work on the Ghauri missile started in the early 1990s and the first test was carried out in 1998. The reliability of the missile came into question after debris fell to earth from a Ghauri test in 2012.8 The test, initially reported as being successful, was described as a “field training exercise” by the Strategic Missile Group of the Pakistan Army Strategic Force Command.10

Pakistan’s most frequently tested missile system as of the end of 2014 is the 750 km-range solid-fueled Shaheen-I, which was handed over to the military in March 2003.11 It is believed to be derived from the Chinese M-11 missile and US officials have suggested China may have provided Pakistan with M-11 missile components, 34 intact M-11 missiles, and “blueprints and equipment … to build a plant for making missiles,” as well as technical assistance with further development of this missile.12 A variant of this missile, dubbed Shaheen-1A, with longer range (about 900 km) has been tested.13 An even longer-range ballistic missile system, the Shaheen-II, with 1500–2500 km-range, is under development. It was first tested in 2004 and may be nearing deployment. In 2014, a Shaheen-II test was described as an Army Strategic Forces Command “field training exercise” that was “aimed at ensuring operational readiness of a Strategic Missile Group.”14 However, this test also aimed at “re-validating different design and technical parameters of the weapon system...” suggesting this missile system may not be ready for deployment. In March 2015, Pakistan tested for the time a Shaheen-III missile, described as having a maximum range of 2750km.15 With a missile of 2000 km range or longer, Pakistan can target anywhere in India.
The 2005 India-Pakistan Agreement on Pre-Notification of Flight Testing of Ballistic Missiles commits the two states to give 72 hours’ notice before a ballistic missile flight test and to not test missiles close to their borders. It does not cover cruise missiles.

Pakistan is developing a nuclear-capable ground-launched cruise missile (Babur) and the Ra’ad air-launched cruise missile with ranges of about 600 km and 350 km respectively. Pakistan began testing these missiles in 2005 and 2007 respectively. The most recent test, conducted in early 2015, involved firing Ra’ad from a Mirage fighter jet, and was the sixth test of this missile system.16 Pakistan may seek to put nuclear-armed cruise missiles on some of its submarines, or modify existing naval missiles to be nuclear capable.17

The most recent system to begin development is the 60 km-range Nasr missile. First tested in 2011, Nasr is described as a battlefield system able to carry “nuclear warheads of appropriate yield” and as “consolidating Pakistan’s deterrence capability at all levels of the threat spectrum.”18 In a test in 2014, a salvo of four Nasr missiles was fired from a multi-tube launcher on the back of a truck.19 Reports suggest that Nasr is presumably intended for use as a short-range battlefield nuclear weapon system against Indian conventional armoured forces during the early stages of a conflict. Analysis of such a scenario suggests Pakistan would need to deploy and use many tens of Nasr missiles to be able to destroy a significant fraction of the 1000 or so Indian tanks that may be involved in such an action.20

There is little public information about the storage and deployment status of Pakistan’s nuclear weapons. It was believed in the late 2000s that “missiles are not mated with warheads and the physics packages (the fissile cores) are not inserted into the warheads themselves.”21 Reports suggested that while warheads are kept in component form, possibly by “isolating the fissile ‘core’ or trigger from the weapon and storing it elsewhere … all the components are stored at military bases.”22 In the years since then, however, Pakistan has moved to developing cruise missiles and a potential battlefield nuclear weapon system. These systems may need nuclear warheads that are lighter and more compact than those that could be carried by the ballistic missiles. These new missiles also may not be as amenable as large, long-range ballistic missiles to having their warheads stored in component form ready to be integrated at short notice.

Seven possible locations for Pakistan’s nuclear weapons storage have been suggested (Table 3). Some of these sites are associated with airbases that are home to nuclear weapon capable aircraft, which may carry either nuclear bombs or air-launched cruise missiles. Other sites are associated with warhead and missile development and assembly facilities, while some sites seem to be secure underground storage for weapons. No site has yet been identified for possible naval nuclear weapons.

Table 3: Pakistan nuclear weapon storage sites, 2014

<table>
<thead>
<tr>
<th>FACILITY NAME/LOCATION</th>
<th>PROVINCE</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sargodha Depot</td>
<td>Punjab</td>
<td>Potential storage site for bombs for F-16s at nearby Sargodha Air Base, and warheads for missiles</td>
</tr>
<tr>
<td>Shanka Dara Missile Complex</td>
<td>Punjab</td>
<td>Missile development and potential warhead storage capability</td>
</tr>
<tr>
<td>Fatejharg National Defense Complex</td>
<td>Punjab</td>
<td>Missile development and potential warhead storage</td>
</tr>
<tr>
<td>Wah Ordnance Facility</td>
<td>Punjab</td>
<td>Possible warhead production, disassembly and dismantlement facility</td>
</tr>
<tr>
<td>Masroor Weapons Depot</td>
<td>Sindh</td>
<td>Potential storage of bombs for Mirage Vs at Masroor Air Base, and warheads for missiles</td>
</tr>
<tr>
<td>Khuzdar Depot</td>
<td>Balochistan</td>
<td>Potential underground weapons storage</td>
</tr>
<tr>
<td>Tarbela Underground Complex</td>
<td>Khyber Pakhtunkhwa</td>
<td>Potential weapons storage</td>
</tr>
</tbody>
</table>

Fissile materials

Pakistan has developed an extensive nuclear infrastructure that allows it to produce both HEU and plutonium for weapons. This includes capacity for uranium mining, uranium enrichment, nuclear reactor fuel fabrication, nuclear reactor construction, and spent fuel reprocessing for plutonium recovery. There is no official information on Pakistan’s fissile material production sites – although Pakistan and India each year exchange lists of nuclear facilities as part of their 1988 Agreement on the Prohibition of Attack against Nuclear Installations and Facilities. These lists may include both military and civilian nuclear facilities, but are not made public.

Table 4 presents a list of Pakistan’s fissile material production-related sites compiled from open sources as of 2014. While the histories and operating capacities of these facilities are not clear, it is well known that Pakistan has been producing HEU for nuclear weapons since the early 1980s and producing plutonium for weapons since the late 1990s.

Table 4: Pakistan’s fissile material related facilities, 2014

<table>
<thead>
<tr>
<th>LOCATION</th>
<th>FACILITY TYPE</th>
<th>MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dera Ghazi Khan</td>
<td>Uranium mine, ore concentration plant, conversion plant</td>
<td>Uranium</td>
</tr>
<tr>
<td>Issa Khel</td>
<td>Uranium mine</td>
<td>Uranium</td>
</tr>
<tr>
<td>Qabul Khel</td>
<td>Uranium mine</td>
<td>Uranium</td>
</tr>
<tr>
<td>Kahuta</td>
<td>Uranium enrichment (Khan Research Laboratories)</td>
<td>HEU</td>
</tr>
<tr>
<td>Gadwal (Wah)</td>
<td>Uranium enrichment (secondary plant)</td>
<td>HEU</td>
</tr>
<tr>
<td>Chaklala</td>
<td>Uranium enrichment (pilot plant)</td>
<td>HEU</td>
</tr>
<tr>
<td>Sihala</td>
<td>Uranium enrichment (pilot plant)</td>
<td>HEU</td>
</tr>
<tr>
<td>Golra</td>
<td>Uranium enrichment (pilot plant)</td>
<td>HEU</td>
</tr>
<tr>
<td>Khushab–I</td>
<td>Heavy-water plutonium production reactor</td>
<td>Plutonium</td>
</tr>
<tr>
<td>Khushab–II</td>
<td>Heavy-water plutonium production reactor</td>
<td>Plutonium</td>
</tr>
<tr>
<td>Khushab–III</td>
<td>Heavy-water plutonium production reactor</td>
<td>Plutonium</td>
</tr>
<tr>
<td>Khushab–IV</td>
<td>Heavy-water plutonium production reactor</td>
<td>Plutonium</td>
</tr>
<tr>
<td>Chashma (Khushab)</td>
<td>Reprocessing facility (being commissioned)</td>
<td>Plutonium</td>
</tr>
<tr>
<td>Rawalpindi</td>
<td>Reprocessing facility–I</td>
<td>Plutonium</td>
</tr>
<tr>
<td>Rawalpindi</td>
<td>Reprocessing facility–II</td>
<td>Plutonium</td>
</tr>
<tr>
<td>Khushab–I-IV</td>
<td>Tritium production</td>
<td>Tritium</td>
</tr>
<tr>
<td>Chashma (Kundian)</td>
<td>Reactor fuel-fabrication plant</td>
<td></td>
</tr>
<tr>
<td>Multan</td>
<td>Heavy-water production facility</td>
<td></td>
</tr>
<tr>
<td>Khushab</td>
<td>Heavy-water production facility</td>
<td></td>
</tr>
</tbody>
</table>

Accurate estimates about Pakistan’s production of HEU for its nuclear weapon programme are limited by uncertainty about Pakistan’s enrichment capacity and the operating history of its centrifuge plants at Kahuta and Gadwal.\textsuperscript{24} It is estimated that, as of the end of 2014, Pakistan could have a stockpile of about 3 tonnes of weapon-grade (90%-enriched) HEU.\textsuperscript{25}

As of the end of 2014, Pakistan operates four weapons plutonium production reactors. A semi-official account states these reactors have a capacity of about 50 MW-thermal, with Khushab-IV possibly being larger, with a capacity of 50-100 MW-thermal.\textsuperscript{26} The Khushab-I plutonium production reactor, a heavy-water-moderated, light-water-cooled, natural-uranium-fueled reactor has been operating since 1997-1998. The Khushab-II reactor started operation in late 2009 or early 2010. Khushab-III began operating early in 2013.\textsuperscript{27} Khushab-IV began operation in 2014.\textsuperscript{28}

Pakistan has been reprocessing spent fuel from the Khushab reactors at the Rawalpindi New Labs facility, which has two reprocessing plants, each with an estimated capacity of 10–20 tons per year of spent fuel.\textsuperscript{29} These plants may not have the capacity to handle all the fuel from the four Khushab reactors, however. The spent fuel from Khushab-III and Khushab-IV may become available for reprocessing in 2015 and 2016 respectively, after the spent fuel has been cooled. As a result, Pakistan is estimated to have produced a total of almost 200 kg of plutonium as of the end of 2014.\textsuperscript{30}

Satellite imagery from January 2015 suggests construction of the large reprocessing plant at Chashma may have been completed, and the facility may be being commissioned or even be operational.\textsuperscript{31} The Chashma reprocessing plant was originally intended to handle 100 tons of spent fuel per year. This capacity would be sufficient in principle to treat all the spent fuel from the four Khushab reactors.

### Infrastructure

Pakistan’s nuclear weapons research, development, and production infrastructure are managed by the military-run Strategic Plans Division (SPD) and overseen by a National Command Authority (NCA) set up in February 2000 by General Pervez Musharraf. The NCA has responsibility for policy concerning the development and use of Pakistan’s nuclear weapons. The NCA is chaired by the Prime Minister, and includes the ministers of foreign affairs, defence, and interior, the chairman of the Joint Chiefs of Staff committee, the military service chiefs, and the director-general of SPD. The founding director-general of SPD, Lt. General Khalid Kidwai, retired after fourteen years of service in December 2013, and was replaced by General Zubair Mahmood Hayat.

The SPD has responsibility for strategic weapons development and nuclear weapons planning and operations, as well as security of the nuclear complex. It also has an arms control group. The total number of staff of the SPD and the various programmes it is responsible for is uncertain. The former head of SPD has suggested that only about 2000 people hold “critical knowledge” of Pakistan’s nuclear weapons complex.\textsuperscript{32} A 2011 report suggested a total of about 70,000 professional staff in the entire strategic weapons complex.\textsuperscript{33} A former SPD official has indicated that as of 2013 the security division alone had 20,000 personnel and the force would grow to a total of 28,000 within a few years.\textsuperscript{34}

The nuclear weapons development and production infrastructure managed by SPD has three broad divisions: the A.Q. Khan Research Laboratory (Kahuta) produces enriched uranium; the Pakistan Atomic Energy Commission is responsible for uranium mining, fuel fabrication, reactor construction and operation, and spent fuel reprocessing to produce plutonium; and the National Development Complex is responsible for weapons and delivery system research and production.\textsuperscript{35} These three bodies are managed by the National Engineering and Scientific Commission.

Pakistan’s nuclear weapons currently are assigned to its Army Strategic Force Command, which has responsibility for ballistic and cruise missiles, and the Air Force Strategic Command, which deals with nuclear armed aircraft. Pakistan’s Naval Strategic Force Command was established in 2012 and charged with “development and employment of … the nation’s 2nd strike capability” but it is not known if this command has yet been issued any nuclear weapons.\textsuperscript{36} Analysts believe Pakistan may be seeking naval nuclear armed cruise missiles that could be fired from ships or submarines.\textsuperscript{37} Following India’s launch in 2009 of its first nuclear-powered ballistic missile submarine, which began sea-trials in 2014, there are suggestions that Pakistan may be seeking a matching capability.\textsuperscript{38}

### Economics

Secrecy about the history and scale of the nuclear weapon and missile programmes, the extent of external technical and material support, and the effect of indirect support through military and economic aid means the full cost of Pakistan nuclear weapons programme cannot be estimated with any reliability. This is part of the larger historical pattern in which military spending largely has been unaccountable, even to Parliament. The annual military budget was debated in parliament in 2008, for the first time since 1965.\textsuperscript{39}

In 2001, retired Major-General Mahmud Ali Durrani (who later served as National Security Advisor to the President of Pakistan) estimated that Pakistan’s annual expenditure on “nuclear weapons and allied programs” was about $300–400 million (USD) and that Pakistan “will now need to spend enormous amounts of money for the following activities: a) a second strike capability; b) a reliable early warning system; c) refinement and development of...
delivery systems; d) command and control systems.”

Citing an earlier estimate by Rammanohar Reddy for the cost of nuclear weapons development by India, Durrani suggested that Pakistan might need to spend about 0.5% of gross domestic product (GDP) for a period of at least 10 years on such nuclear weapons activities.

General Pervez Musharraf, who seized power in 1999 and ruled until 2008, and held the positions of Chief of Army Staff and President, affirmed in 2004 that there had been a significant increase in nuclear weapon spending after 2000 (when SPD had been established) as part of a 15 year plan. General Musharraf claimed in particular that during the previous three to four years the government had spent more on the nuclear weapons programme than in the previous 30 years. This increase in spending would be consistent with the large expansion in fissile material production capabilities and new missile system development that occurred after the year 2000.

An independent estimate in 2011 suggested Pakistan’s nuclear spending could be about $800 million per year and possibly as much as $2 billion per year if health and environmental costs are included — and this spending was projected to rise significantly because of Pakistan’s expanding nuclear programme.

This estimate relies on an unsubstantiated 2009 Pakistani newspaper report that annual spending on “core classified development programs” was not more than Rs. 10 billion and that overall the “strategic organisations of the country... got less than 0.5 per cent of the GDP.”

Pakistan’s GDP was about $840 billion in purchasing power parity terms, and $232 billion in nominal terms in 2013 — the latest year for which World Bank data is available.

Assuming that Pakistan spends on the order of 0.5% of GDP on its nuclear weapons, and using purchasing power parity rather than market exchange rates to convert Pakistani rupees to US dollar equivalents, since most of the spending is for goods and services provided from within the country rather than imports, suggests that in 2013 nuclear weapon programme spending may have been up to about $4 billion a year.

For Pakistan to spend on the order of $4 billion per year on its nuclear weapons is feasible. The annual official military spending for 2014–2015 was budgeted at Rs700 billion, a 10% increase from the previous year. Reports suggest this military budget does not include military pensions and various other direct and indirect costs associated with the armed forces and that including these costs would increase Pakistan’s total military budget for 2014–2015 to around Rs. 1113 billion (about $38 billion, using current purchasing power parity exchange rates). This would suggest that, in purchasing power terms, as of 2013, Pakistan spent the equivalent of about 10% of its conventional military budget on nuclear weapons.

Pakistan is not reliant only on its own resources to support its military spending, including on nuclear weapons, or to meet its development needs. Since 2001, Pakistan has received an estimated $31 billion in military and economic assistance from the United States, of which about $10 billion was economic aid of various kinds. The Congressional Research Service reported that in 2006, the United States signed arms deals with Pakistan for over $3.5 billion, including for 36 new F-16 jet fighters ($1.4 billion) and associated missiles and bombs (over $640 million) and upgrades for Pakistan’s existing, older F-16 fighters ($890 million).

Reflecting its concerns after September 2001 about the vulnerability of Pakistan’s nuclear weapon and fissile materials to seizure by Islamist militants, the United States has provided Pakistan on the order of $100 million worth of assistance to secure its nuclear weapons, facilities, and materials.

Pakistan has also received extensive military assistance from China for its nuclear weapons, missile, and conventional weapons programmes. According to A.Q. Khan, in the early years of Pakistan’s uranium enrichment programme, China supplied 15 tons of uranium hexafluoride (the gas used in centrifuges), 50 kg of weapon-grade HEU (enough for two weapons), the design details for a nuclear weapon, and technical help with the nuclear weapons programme.

Khan claims he provided China with the details of the European uranium enrichment gas centrifuges that Khan had acquired and provided training for Chinese technicians.

China’s conventional military assistance to Pakistan is beginning to rival the scale of support provided by the United States. In 2011, China agreed to fully fund the sale of 50 JF-17 jet fighters with advanced avionics to Pakistan. According to Pakistan’s Defence Minister Ahmad Mukhtar, these jets cost about $20–25 million each, which suggests that the total cost of the 50 JF-17 deal with China is about $1 billion or more. Pakistan was also reported in 2014 to be close to buying six new submarines from China. Pakistan dependence on military assistance from China is likely to grow as Pakistan’s poor relations with the United States worsen.

Given its high levels of military spending and poor government finances because of governance failures, Pakistan is dependent on economic aid to meet even basic development needs. In December 2011, the World Bank announced a $5.5 billion aid package to support “poverty reduction and development” in Pakistan for the three-year period 2012–2014. For comparison, between 1952 and 2003, the World Bank committed $18.2 billion of aid to Pakistan. A comparison of a different sort is offered by the estimated damage of $10 billion caused by the 2010 floods in Pakistan that displaced some 20 million people and flood-
ed over 50,000 square km area of land, and is described by the government of Pakistan as an “unprecedented calamity”. 59

International law and doctrine

Pakistan is not a signatory to the nuclear Non-Proliferation Treaty (NPT), nor has it signed the Comprehensive Test Ban Treaty (CTBT), and it appears to recognize no international legal obligation to restrain or end its nuclear weapons and missile programme. 60 Pakistan has said, however, that it supports “negotiation of a nuclear weapons convention along with a phased programme for the complete elimination of nuclear weapons within a specified time frame.” 61

Pakistan is the subject, along with India, of a unanimous UN Security Council resolution calling for restraint of its nuclear weapon and ballistic missile programmes. Resolution 1172 (June 1998) calls upon India and Pakistan immediately to stop their nuclear weapon development programmes, to refrain from weaponization or from the deployment of nuclear weapons, to cease development of ballistic missiles capable of delivering nuclear weapons and any further production of fissile material for nuclear weapons, to confirm their policies not to export equipment, materials or technology that could contribute to weapons of mass destruction or missiles capable of delivering them and to undertake appropriate commitments in that regard. 62 As of the end of 2014, Pakistan is clearly in violation of this Security Council resolution, as is India and possibly those countries that have exported nuclear and missile related technologies and materials to Pakistan and India.

Pakistan has continued to block talks at the United Nations Conference on Disarmament (CD) on a possible international treaty banning the production of fissile materials for nuclear weapons (commonly known as a fissile material cut-off treaty or FMCT). Most recently, in January 2015, Pakistan’s objection prevented the consensus required by the CD rules of procedure to agree the annual programme of work and so ensuring there will be no formal FMCT talks this year. 63

Pakistan explained at the CD in June 2014 that its concerns about a possible FMCT stem from India having accumulated a larger total fissile material stockpile than Pakistan, and the decision by the United States and other key countries, including those of the 48-nation Nuclear Suppliers Group (NSG), to waive three-decade old nuclear trade sanctions on India but to leave them in place for Pakistan. 64 NSG guidelines had forbidden members from selling uranium, nuclear reactors, and fuel cycle technologies to countries that were outside the NPT because such sales could allow the target countries to expand their nuclear weapons programme. In late 2011, Zamir Akram, Pakistan’s ambassador to the UN Conference on Disarmament, proposed that if Pakistan received a waiver from the NSG similar to the one granted to India, Pakistan would be willing to join talks on an FMCT.

To address its concerns about India’s larger stockpile, in 2014 Pakistan proposed that an FMCT should include the obligation to put under international monitoring:

• fissile material that has not been weaponized as yet, but set aside either for new warheads or for the replacement and refurbishment of existing warheads;
• irradiated fuel and reactor-grade separated plutonium produced from any unsafeguarded reactor, military or otherwise;
• fissile material from retired warheads or those in the dismantlement queue, including such material already in waste disposal sites;
• fissile material declared excess for military purposes;
• fissile material for non-proscribed military purposes like naval propulsion etc.; and
• fissile material designated for civil purposes.

This proposal would serve to freeze the size of nuclear weapon arsenals and suggests Pakistan may intend to keep its entire fissile material stockpile in the form of components in deployed warheads or as stored warhead components. Safeguards on the second category of material are clearly intended to capture India’s large stockpile of unsafeguarded spent fuel and separated plutonium for its nuclear power reactors and prevent its possible use in weapons. This would serve to give Pakistan the parity that it seeks with India in fissile material stockpiles potentially available for weapons.

Pakistan’s long-running search for strategic parity with India informs almost all its nuclear diplomacy. 65 It is debatable whether Pakistan’s FMCT proposal is intended as a serious constructive suggestion or a diplomatic move to lessen the perception of Pakistan as being stubbornly uncooperative on this issue. Regardless, it is unlikely that the other nuclear-armed weapon would accept such broad constraints as part of an FMCT. Progress towards an FMCT at the CD may have to wait until Pakistan’s SPD believes it has a big enough plutonium stockpile or the international community decides to make achieving an FMCT a much higher priority in its relationships with Pakistan.

Public discourse

Nuclear weapons have played a major role in Pakistan’s domestic political discourse for over 40 years. Prime Minister Zulfiqar Ali Bhutto, who launched the nuclear weapons programme in 1972, famously declared that Pakistan would get the bomb even if its people had to eat grass. Since then, Pakistani governments have sought to create a positive image of the nuclear weapons programme, often by linking it to national pride and national identity.
After the nuclear tests of May 1998, Pakistan’s military and political leaders saw the bomb as a panacea for solving many long-standing national political, social and economic problems. One assessment observes that at the time Pakistan’s leaders “told themselves and their people that the bomb would bring national security, allow Pakistan to liberate Kashmir from India, bind the nation together, make its people proud of their country and its leaders, free the country from reliance on aid and loans, and lay the base for the long-frustrated goal of economic development.”67 None of these hopes have come to pass in the nearly two decades since then.

Pakistan’s major political parties nonetheless remain determined in their support for the nuclear weapons programme. The Pakistan Muslim League (PML), which came to power after the elections in 2013 and is led by Prime Minister Nawaz Sharif, claims credit for the bomb; the previous PML government, also led by Nawaz Sharif, ordered the 1998 nuclear tests. Pakistan’s other national political party, the Pakistan People’s Party (PPP) also claims credit for the nuclear programme because the PPP and the nuclear weapons programme were both founded by Zulfikar Ali Bhutto. Bhutto’s daughter Benazir led the PPP and served two terms as Prime Minister, and after her assassination in 2007 her widower Asif Zardari took control of the PPP and became President of Pakistan. It is common place for Prime Ministers to inaugurate nuclear facilities and they are often photographed at nuclear missile tests and send public messages of commendation and congratulations after such tests.

The central thrust of most public debate about Pakistan’s nuclear weapons is the struggle with India that has shaped Pakistan’s history and politics since the two countries were formed by the partition of British India into independent states. Pakistan’s nuclear weapons are widely seen as a response to India’s nuclear weapons and its larger conventional military forces, and the experience of wars in 1947, 1965, 1971, and 1999, and many crises that threatened to lead to war. Pakistani fears of Indian hegemony have increased in recent years as India’s economy has started to grow at a much faster rate than Pakistan’s and as India has increased its already much larger military budget at a much faster rate.

The domestic nuclear debate in Pakistan was from time to time sensitive to international pressure on Pakistan to restrain its nuclear weapons programme. Ever since the attacks on the United States in September 2001, the United States and most of the outside world has not given high priority to confronting Pakistan’s nuclear buildup and the nuclear arms race with India. The focus has been on maintaining a good relationship with Pakistan’s army seen as a vital ally in the war against the Taliban in Afghanistan and a check on radical Islamist militancy. Given the situation in Afghanistan, and the continued concern about Islamist militant groups, this focus is unlikely to change for the foreseeable future.

The underlying dynamics of the Pakistan-India relationship may be shifting, however. A longer-term concern now driving Pakistan’s nuclear programme is the United States’ policy of cultivating a much stronger US strategic relationship with India to counter the rise of China as a potential great power competitor.68 India’s relationship with China is marked by both growing economic cooperation and increasing military competition, while China is becoming a closer military, political, and economic partner for Pakistan. This four-way relationship will tie the future of Pakistan’s nuclear weapons, and those of India, to the emerging contest between the United States and China for long-term global hegemony, making nuclear restraint and disarmament increasing unlikely in South Asia.
Pakistan begins operating third Khushab plutonium production reactor, 18 November 2012.


35. Key facilities in Pakistan’s nuclear weapons program infrastructure are described in Nuclear Black Markets: Pakistan, A.Q. Khan and the Rise of Proliferation Networks, op. cit.


45. For Pakistan’s GDP in recent years in purchasing power parity and nominal terms, see for example World Bank assessment at http://data.worldbank.org/country/pakistan.


50. Ibid.


53. Ibid.


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