

# LEARN ABOUT NUCLEAR WEAPONS

## *Japan*

Since the American nuclear attacks at the end of World War II, Japan has been a strong opponent of nuclear weapons. Japan's "Atomic Energy Basic Law" allows only peaceful nuclear activities, and its "Three Non-Nuclear Principles" pledge that Japan will not possess, produce, or permit the introduction of nuclear weapons into the country. The country also has a so-called peace article in its constitution (Article IX), which renounces war and the threat of force as a means to settle international disputes.<sup>1</sup> Japan did not even have a defence ministry until 1997, and the establishment of one at that time can be perceived as a reevaluation of its security strategy and a willingness to give up its anti-war position. Despite its declared pacifism, Japan has one of the world's largest military budgets – 43,701 million US dollars in 2006.<sup>2</sup> The country has the material, the technical capacity, and the financial capital to produce nuclear weapons within a year if it were to decide to take this step.

Japan has developed a nuclear program for non-military purposes since the 1950s. Its first commercial reactor began operating in 1966. Today, nuclear energy accounts for 30% of Japan's total energy production. Japan has few natural resources of its own, and depends on imports for some 80% of its energy needs.<sup>3</sup>

Japan today imports all uranium for its nuclear power reactors, mainly from Australia, Canada and Kazhakstan. Private companies have taken over most of the uranium mining activities abroad, but with a 50 percent state subsidy. <sup>4</sup> Japan has been developing a complete domestic nuclear fuel cycle industry, based on imported uranium. Facilities for uranium enrichment and plutonium reprocessing are found in Rokkasho-Mura.

In the uranium enrichment facility, natural uranium can be enriched to approximately 3-4 % to be used in power reactors. The problem is that the same equipment that is used to enrich uranium for nuclear power can also be used to enrich uranium for nuclear weapons. Japan also has large stockpiles of highly enriched uranium (HEU), about 2 tonnes, delivered both by the US and the UK. There is also a plan for delivery of HEU back to the US to reduce Japanese stockpiles.<sup>5</sup> Since 1956, the Japanese policy has been to maximize the use of imported

uranium, extracting an extra 25-30% of energy from nuclear fuel by recycling the unburned uranium and plutonium as mixed-oxide fuel (MOX). Japan has announced plans to use MOX fuel in 16-18 reactors by the year 2010. Major local protests, however, have prevented this so far.<sup>6</sup>

By extracting plutonium from nuclear fuel waste, weapons-grade plutonium or MOX-fuel can be obtained. Japan currently has about 4.6 tonnes of weapons-grade plutonium stored domestically, with another 25 tonnes stored in the UK and France.<sup>7</sup> A nuclear device of the size that was dropped over Nagasaki in 1945, killing 70,000 people, requires about six kilos of plutonium. Japan's reprocessing of plutonium to run its nuclear power reactors has raised suspicions of a secret nuclear weapon programme.

### *Argentina*

Although Argentina never produced or tested nuclear weapons, from the 1960s to 1990s Argentina's uranium-based nuclear program and its ballistic missile program were a source of international concern. This concern was mainly based on the stated intention of the Argentine government to build nuclear weapons, and to provide missile technologies to other countries. Moreover, Argentina refused to join the nuclear NPT until February 1995, and its nuclear facilities were not covered by any safeguards agreement in the 1960s and 1970s.

When authoritarian rule ended in the early 1980s, the nuclear program was placed under civilian control. A policy of rapprochement with Argentina's regional rival Brazil led to the creation of a bilateral inspections body for nuclear materials and sites in both countries called the Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC). Under pressure from the United States, the Argentine government began to dismantle its missile program in 1993 and joined the Missile Technology Control Regime (MTCR), as well as various export control groups. The accession to the Treaty of Tlatelolco in 1994 and the NPT in 1995 led to further adherence to international non-proliferation norms.<sup>8</sup>

Argentina has large stockpiles of fissile material. The uranium enrichment facility at Pilcaniyeu was started by the military junta in 1978 and was put under IAEA control in 2000. In August 2006, Argentina's Atomic Energy Commission announced a wish to resume uranium enrichment at Pilcaniyeu. In February 2008, however, the Presidents of Argentina and Brazil announced an agreement to build a common uranium research facility.<sup>9</sup>

### *Brazil*

From the 1970s to 1990s, Brazil's nuclear energy and missile programs raised several concerns with the international community. Brazil refused to join the nuclear NPT

until 1997, and its nuclear program was initially based on an unsafeguarded uranium enrichment facility. In 1975, the Brazilian military launched a covert nuclear weapons program called the "Parallel Program," which produced two nuclear weapons. The Parallel Program was exposed to the public in 1988 and was shut down in 1990. It was later revealed that Brazil secretly sold eight tons of uranium to Iraq in 1981.

The easing of the Argentine-Brazilian nuclear rivalry in the 1980s and 1990s allowed for greater transparency regarding the Brazilian nuclear program. The Brazilian-Argentine Agency for Accounting and Control of Nuclear Materials (ABACC), established in 1990, and other bilateral agreements established a safeguards system to verify the peaceful uses of nuclear energy in both countries.

In spring 2004, Brazil faced criticism when it didn't allow full IAEA access to its uranium enrichment facility. The IAEA had raised the concern that Brazil may have acquired nuclear materials through the A. Q. Khan network. Moreover, the Brazilian government announced a plan to expand its enrichment activities for domestic use and sale to other countries. At the same time, Brazil maintained that its nuclear program only serves peaceful purposes. The dispute was resolved in November 2004 when Brazil allowed unhindered IAEA inspections of its uranium enrichment site.<sup>10</sup>

Brazil has the most developed nuclear technology in Latin America, with an advanced programme for the production of fissile material and several nuclear research and development facilities – both civilian and military. In May 2006 the first Brazilian uranium enrichment facility was inaugurated, although it had been active since 2004. Moreover, in February 2008 the Presidents of Argentina and Brazil announced an agreement to build a common uranium research facility.<sup>11</sup> Brazil has no plutonium reprocessing facilities. In 1975, then-West Germany was to deliver a reprocessing plant to Brazil – a deal which never was realized.<sup>12</sup>

Experts point out that Brazil's technological capability seems to be ahead of Iran's, yet Brazil's program has hardly been in the news, as the government has managed to assure the international community its intentions are industrial and commercial, not military.<sup>13</sup>

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- 1 Nuclear Threat Initiative [http://www.nti.org/e\\_research/profiles/Japan/index.html](http://www.nti.org/e_research/profiles/Japan/index.html)
  - 2 SIPRI Military Expenditure Database, 14 May, 2008
  - 3 World Nuclear Association <http://www.world-nuclear.org/info/inf79.html>, <http://www.world-nuclear.org/info/reactors.html>
  - 4 WISE <http://www.wise-uranium.org/upasi.html#JP>
  - 5 Institute for Science and International Security [http://www.isis-online.org/global\\_stocks/end2003/civil\\_heu\\_watch2005.pdf](http://www.isis-online.org/global_stocks/end2003/civil_heu_watch2005.pdf)
  - 6 World Nuclear Association <http://www.world-nuclear.org/info/inf79.htm>
  - 7 Cabinet Office: MEXT, METI <http://www.aec.go.jp/jicst/NC/kokusai/20070918e/1.pdf>
  - 8 Nuclear Files <http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/proliferation/argentina/index.htm>
  - 9 The Associated Press. “*Argentine, Brazil presidents pledge to pursue peaceful nuclear energy cooperation*”. International Herald Tribune, 22 februari, 2008. <http://www.iht.com/articles/ap/2008/02/22/news/Argentina-Brazil-Nuclear-Energy.php>
  - 10 Nuclear Files <http://www.nuclearfiles.org/menu/key-issues/nuclear-weapons/issues/proliferation/brazil/index.htm>
  - 11 The Associated Press. “*Argentine, Brazil presidents pledge to pursue peaceful nuclear energy cooperation*”. International Herald Tribune, 22 februari, 2008. <http://www.iht.com/articles/ap/2008/02/22/news/Argentina-Brazil-Nuclear-Energy.php>
  - 12 Arms Controls Association [http://www.armscontrol.org/act/2005\\_10/Oct-Brazil.asp](http://www.armscontrol.org/act/2005_10/Oct-Brazil.asp)
  - 13 Reaching Critical Will <http://www.reachingcriticalwill.org/about/pubs/Inventory07/Brazil.html>