Chapter 1

Making the Case for Divestment

Fortunately there is an increase in divesement efforts over the last years. There are more financial institutions now than last year that refuse to finance the nuclear weapon industry. With that, they diminish available investment capital and they promote the further stigmatisation of nuclear weapons. In some countries, government or the parliament has started to respond to divestment campaigns by discussing or even passing national legislation (Switzerland) or by setting new guidelines for national pension fund investments (as in Norway).

While it is unlikely that divestment by a single financial institution would create sufficient pressure on a company for it to end its involvement in nuclear weapons work, divestment by even a few institutions based on the same ethical objection can have a significant impact on a company's strategic direction. Exclusions by financial institutions do have a stigmatising effect and can convince directors to decide to reduce reliance on nuclear weapons contracts and expand into other areas.

This section briefly reviews some of the reasons that financial institutions should develop comprehensive policies prohibiting any investment in nuclear weapon producers.

Indiscriminate weapons

Nuclear weapons – like other weapons of mass destruction - are indiscriminate. No matter what the circumstances on a battlefield and no matter what technological prowess the warring parties possess, the destructive effects of nuclear weapons by definition cannot be limited to military forces. As such, any use of nuclear weapons is indiscriminate due to the very nature of the weapon. For this reason, the taboo on the use of nuclear weapons has been growing since they were first used in 1945 against civilians in Hiroshima and Nagasaki.

Disproportionate weapons

One of the fundamental principles of international humanitarian law is the principle of proportionality. Nations are prohibited from launching attacks that may be expected to cause incidental loss of civilian lives, injury of civilians or damage to civilian objects that would be "excessive in relation to the concrete and direct military advantage anticipated".[1] Given the catastrophic humanitarian and environmental consequences of any use of nuclear weapons, it is difficult to imagine a scenario in which the use of these weapons would be in conformity with this fundamental international humanitarian law principle.

Toxic weapons

Nuclear weapons have effects beyond their immediate use. The heat and blast waves are responsible for most of the immediate deaths of a nuclear detonation, But it is the radiological fallout that is the killer that you cannot see, smell or hear. Radiological fall-out contaminates areas far beyond the immediate battlefield. Depending on the yield and type of a warhead that is detonated and influenced by local geographic and weather conditions, radioactive debris, dust and moisture can contaminate enormous areas. Contamination is not limited to humans, but impacts local animal and plant life, and can lead to contamination of soil and ground water.

The radiological effects of nuclear weapons continue long after the events that led to the decision to use them. Depending on the yield, nuclear explosions render large areas uninhabitable and much larger areas economically unviable – no one wants to live or work in an area contaminated by a nuclear explosion. Moreover, radiation can continue to affect humans, animals and plant life over generations, causing birth defects, higher rates of cancer, immunodeficiency disease, and more.

Continued nuclear possessions encourages proliferation

Recent NATO policy documents say that "*as long as there are nuclear weapons.... NATO will remain a nuclear alliance*", and policies of many of the current nuclear weapon possessing states say something similar. But this logic works the other way around as well: as long as some states keep nuclear weapons, others may feel the need to develop their own. The ultimate threat by some with the possible use of nuclear weapons leads to the ultimate desire of others to defend against or deter nuclear weapons. Only verifiable and irreversible disarmament by all will lead to a new situation in which the possession and use of nuclear weapons is impossible.

> "There is presently no effective capacity at the international level to deliver appropriate humanitarian assistance to survivors if nuclear weapons were ever to be used."
>
> *International Committee of the Red Cross, 2013*

The Non-Proliferation Treaty has helped to regulate nuclear weapons possession and to prevent rapid proliferation. But it has also maintained a status quo in which some states can get away with endlessly stalling the dismantlement of their nuclear arsenals, while it has been unable to prevent some other states from choosing to 'go nuclear', such as India, Israel, North Korea and Pakistan. Yet, of the 193 UN member states, 179 do not have nuclear weapons on their soil and a majority of 115 member states are already part of a regional treaty banning nuclear weapons. It is time to achieve a universal ban on nuclear weapons.

Legal questions

Nuclear weapons, although unique in their intergenerational destructive capacity, are still just weapons. Like other weapons, they are and can be regulated by international law. Currently, there is no piece of international law that makes nuclear weapons illegal for all countries. Those who have signed the nuclear Non Proliferation Treaty (NPT), who did not test nuclear weapons before 1967, have agreed to never develop them. For these countries, developing or acquiring nuclear weapons is indeed illegal. For the countries who tested nuclear weapons before 1967 however, the weapons themselves are not illegal. Instead, China, France, Russia, the UK and the US are legally bound to negotiate the disarmament of their nuclear arsenals. In addition, the NPT is not universal. Countries that have not signed the NPT, such as India, Israel and Pakistan, are not bound by its regulations.

Whilst it is not explicitly stated, the prohibition on assisting in Article II of the nuclear Non Proliferation Treaty (NPT) should be read to prohibit investments in nuclear weapon producers regardless of whether that production takes place in a recognised nuclear armed state or not. Providing financial assistance and financial services to companies producing nuclear weapons is a clear example of "assistance".

There is no comprehensive or universal ban in international law on the use or possession of nuclear weapons, but in July 1996 the International Court of Justice concluded that international humanitarian law (IHL) does apply to the *use* of nuclear weapons and that their use will generally be contrary to IHL principles and rules. As such, possession, but also the manufacturing of nuclear weapons is in itself not illegal, but use is. For financial institutions, it can be argued that their involvement in the nuclear weapon industry is aiding in preparations to violate international humanitarian law.

While there is no specific treaty-based prohibition on investing in companies that produce nuclear weapons, some regional nuclear-weapon-free zones prohibit states from assisting or encouraging the manufacture of nuclear weapons. This prohibition could be interpreted to cover investments,

depending on the nature and size of the investments.

- Latin American Nuclear-Weapon-Free Zone Treaty: Nations must not take any action "to assist or encourage" the development or manufacture of nuclear weapons inside or outside the zone.[2]
- South Pacific Nuclear Free Zone Treaty: Nations must not do anything "to assist or encourage the manufacture" of nuclear weapons by any other nation, whether it is in the zone or not.[3]
- African Nuclear-Weapon-Free Zone Treaty: Nations must not "take any action to assist or encourage the research on, development, manufacture … of any nuclear explosive device".[4]
- Southeast Asian Nuclear-Weapon-Free Zone Treaty: Nation must "refrain from engaging in, encouraging or authorizing, directly or indirectly, … manufacture … of any nuclear weapon".[5]

Additionally, some nations have enacted domestic legislation prohibiting companies from facilitating the manufacture of nuclear weapons. For example, in Australia it is a crime for a person or company to do "any act or thing to facilitate the manufacture, production, acquisition or testing" of nuclear weapons anywhere in the world[6], there is similar legislation in New Zealand. A company is also prohibited from providing services, including lending money, to another company if it "believes or suspects, on reasonable grounds, that the services will or may assist a weapons of mass destruction program".[7]

Sustainability

Although many financial institutions have signed on to accords promoting environmental sustainability – such as the UN Principles for Responsible Investment, the Global Compact and the UN Environment Programme's Financial Initiative – many of these institutions continue to invest in nuclear weapon producers. We believe such investments to be incompatible with their commitments to environmental sustainability, given the potential of devastating environmental effects of the use of nuclear weapons, but also of testing and the production of nuclear weapons. The Hiroshima and Nagasaki bombings in 1945, as well as more than 2000 nuclear test-explosions and a series of documented incidents with nuclear materials in the past decades have provided us with sufficient data to conclude that nuclear weapons are a threat to the environment.

Scientists predict that the use of even a small fraction of the world's nuclear weapons – 100 Hiroshima-sized bombs – would lead to global climatic disruption, reduced sunlight and rainfall, mass starvation due to agricultural collapse, and the destruction of many plant and animal species. Humans rely on the environment for food production, drinkable water and the natural conditions to continue life. Dramatic changes in the environment would have major effects on our own health and survival. A war fought with more than a thousand nuclear weapons would most likely leave the planet uninhabitable.

Switzerland: Divestment and the Swiss War Materials Act

By Andy Nidecker

The report "Don't Bank On The Bomb" published in March 2012 identified seven, mostly globally active Swiss banks, involved in the financing of a number of Nuclear weapon producers. Board members of the Swiss affiliate of the International Physicians for the Prevention of Nuclear War (IPPNW) and ICAN Europe Middle East and Africa decided to approach the two banking giants UBS and Credit Suisse to discuss the report, alert the bankers to the official position of Switzerland in favour of nuclear abolition and lastly question existing lending practices and financial divestment.

In the meetings the humanitarian impact of nuclear weapons; the strong stand of both the Swiss MFA and the ICRC against nuclear proliferation, and the activities of IPPNW and ICAN were emphasised. The bankers in turn stressed that that - unlike chemical or biological weapons - nuclear weapons are not forbidden by international law. They added that therefore it remains their clients' decision where investments are made. They also recognised that it is likely many of their clients are unaware of the full spectrum of goods being produced by a weapons producing corporation. Representatives saw a need to improve the way such information is shared with clients.

The Swiss War Materials Act (WMA) in Article 7 defines nuclear, biological and chemical weapons, as well as antipersonnel mines and cluster munitions as illegal and prohibits their development, production, acquisition and storage, as well as their import and export.

A revised Swiss War Materials Act entered into force in February 2013 adding that Switzerland is actively seeking the delegitimisation of nuclear weapons, including their complete ban by international law. It specifically addresses the financing of nuclear weapons, stating that both direct and indirect financing of prohibited war materials, including nuclear weapons, are illegal. Monitoring and enforcement of these new financial restrictions, as outlined in the revised Swiss WMA, will be done by the Swiss state Secretariat for Economic Affairs (SECO). Implementation is currently being discussed with the Swiss Bankers Association.

In Switzerland there is keen awareness about the relations between financial institutions and the nuclear weapon industry. Financing nuclear producers is illegal in Switzerland and NGOs like IPPNW and activists of ICAN will continue to monitor the implementation of the revised WMA.

Australia: The Future fund goes Ballistic

By Tim Wright

Opinion polls show that Australians overwhelmingly oppose nuclear weapons. So when we learned in 2011 that our major federal government investment fund – the so-called Future Fund – has substantial investments in nuclear weapon companies, there was widespread public uproar.

Melbourne's leading daily newspaper, The Age, ran a front-page story with the headline: "Australia investing in nuclear arms." The following day, readers reacted angrily on the letters pages, and a cartoon depicted businessmen being hurled through the air by an exploding nuclear bomb. "The Future Fund goes ballistic," read the caption.

We uncovered this controversial information using freedom-of-information laws, which allow any member of the public to gain access to documents held by Australian government agencies. There was no charge for this service.

When the news broke, the Future Fund stated that it had no plans to divest from companies involved in nuclear weapons production, even though it had earlier divested from cluster munitions and landmines. It claimed that countries such as the United States, Britain and France possess nuclear weapons legitimately.

Not satisfied with this response, we encouraged friendly senators to quiz the Future Fund leadership about their position in the parliament. This helped keep the issue on the political agenda. The minister overseeing the fund, Senator Penny Wong, was forced to defend the position.

We then commissioned legal advice from a team of top barristers, who found that the Future Fund had failed to comply with its own stated investment policies. They noted that, under Australian law, it is an offence to assist the "manufacture, production, acquisition or testing" of nuclear explosive devices both inside and outside Australia.

More recently, we submitted 14,000 petition signatures to the chair of the Future Fund demanding that he back efforts to achieve a nuclear-weapon-free world. We also protested outside the Future Fund's headquarters. We believe that it should set a positive example for other financial institutions in Australia.

The Don't Bank on the Bomb report in 2012 revealed that most Australian banks have provided loans to nuclear weapon companies at some stage since 2008. Disappointingly, none have shown a willingness to divest, but they draw the line at financing projects specifically for nuclear weapons work.

As part of our divestment campaigning, we have also approached all major Australian superannuation funds. Some of the more progressive funds agreed to conduct a review of their investments to ensure that no nuclear weapon companies had slipped through the gaps. Others noted that their "ethical" options (but not their general funds) already exclude the arms industry.

In 2013 we launched a report on university investments in nuclear weapon companies, titled Disarm Your Degree. Although the universities we targeted were all public institutions, it was often difficult to find detailed information on their investments. Where we could confirm they invested in nuclear weapon companies, we have worked with students and academics to build pressure for divestment.

While tangible successes to date have been limited, our work has at least helped raise public awareness about the ongoing threat of nuclear weapons. It has shown how this global problem can be dealt with at a local level, even in countries without nuclear weapons. And it has reinforced the need for a total ban on nuclear weapons – so no financial institution can ever claim these weapons are "legitimate".

Tim Wright is Australian director of ICAN.

Stopping the development of new nuclear weapons

When financial institutions invest in nuclear weapon producers, they provide the financing to maintain, refurbish, test, and modernise nuclear weapons. All of the nuclear armed countries are modernising their arsenals. This section provides an overview of the nuclear armed countries and their modernization plans. Reaching Critical Will, the disarmament programme of the NGO the Women's International League for Peace and Freedom, provides an excellent annual report on the status of modernisation plans, much of the information in this section has been reproduced with permission from their report "Still Assuring Destruction Forever".

China[8]

Estimates suggest China currently has approximately 170 nuclear warheads including approximately 110 operationally deployed nuclear missiles, approximately 60 warheads stored for its submarine-launched ballistic missiles, and bombers. Each nuclear ballistic missiles carries a single warhead.[9] It is difficult to estimate the cost of China's nuclear weapon force. However, assuming that China consistently maintains 5% of its overall military expenditure for its nuclear weapons programme, China would have spent between USD4.5 and $9 billion on its nuclear programme in 2011.[10] A recent report by the organisation Global Zero estimates China's nuclear cost to be $7.6 billion in 2011.[11]

Nuclear Arsenal[12]

Name [13]	**Type** [14]	**Producers**
DF-5A (CSS-4)	ICBM	Chinese Academy of Launch Vehicle Technology (CALT) [15]
DF-31A (CSS-10 Mod 2)	ICBM	Academy of Rocket Motors Technology (ARMT) [16]
DF-4 (CSS-3)	ICBM	Chinese Academy of Launch Vehicle Technology (CALT) [17]
DF-31A (CSS-10 Mod 1)	ICBM	Academy of Rocket Motors Technology (ARMT) [18]
DF-3A (CSS-2)	MRBM	Chinese Academy of Launch Vehicle Technology (CALT) [19]
DF-21 (CSS-5 Mods 1/2)	MRBM	China Changfeng Mechanics and Electronics Technology Academy [20] Academy of Rocket Motors Technology (ARMT) [21]
JL-1 (CSS-NX-3)	SLBM	Academy of Rocket Motors Technology (ARMT) [22]
CJ-10 (DH-10) [23]	LACM	Sanjiang Aerospace Group [24]
DF-15 (CSS-6)	SRBM [25]	Academy of Rocket Motors Technology (ARMT) [26]
CJ-20	ALCM [27]	Sanjiang Aerospace Group [28]
?	Gravity bomb(s) [29]	?

According to Hans Kristensen from the Federation of American Scientists,
China, Israel, India, Russia and Pakistan have nuclear gravity bombs, but little detail is known.

Modernization

China is concerned with maintaining what it sees as a "limited" and "effective" nuclear arsenal and its modernization programme has focused on increasing the "survivability" of its land-based strategic missiles. It is reportedly phasing out its older missiles and replacing them with new ones in order to increase their range and sophistication.[30] It is expected that after this is accomplished, China will speed up the modernization of its sea-based strategic force. China has been reported to be replacing its first generation ballistic nuclear missile-carrying submarines.[31] None of the companies identified in this report show contracts with China with any relation to its nuclear weapons programme.

France[32]

France possesses approximately 300 nuclear warheads, about 290 of which are deployed or operationally available for deployment on short notice.[33] Its delivery vehicles consist of approximately 40 aircraft assigned a total of 40 cruise missiles; and four nuclear-powered ballistic missile submarines (at least two of which are always operational) equipped with nuclear armed long-range ballistic missiles.[34] The French government has indicated that it spends approximately USD4.6 billion on its nuclear forces each year,[35] though a recent report from Global Zero estimates that the total cost for 2011 was approximately $6 billion.[36]

Nuclear Arsenal[37]

Name [38]	Type [39]	Producers [40]
ASMP-A	ALCM	MBDA Missile Systems Finmeccanica EADS Group
M45	SLBM	EADS Safran
M51.1	SLBM	EADS Safran

Modernization

France is in the middle of a broad modernization of its nuclear forces involving submarines, aircraft, missiles, warheads, and production facilities that will continue for another decade. The modernization programme will ensure that it can maintain its capability until at least the 2030s.[41] Of the companies identified in this report, EADS and Safran are contracted to work on the French nuclear arsenal.

India[42]

India is estimated to have 80–100 nuclear warheads.[43] It is also developing a range of delivery vehicles, including land- and sea based missiles, bombers, and submarines.

Nuclear arsenal

Name [44]	Type [45]	Producers
Agni-1	MRBM	Indian Defense Research and Development Laboratory (DRDL) [46] Bharat Dynamics Limited (BDL) Indian Defence Research and Development Organization (DRDO)
Agni-2	MRBM	Indian Defense Research and Development Laboratory (DRDL) [47] Bharat Dynamics Limited (BDL) Indian Defence Research and Development Organization (DRDO)
Agni-3	ICBM	Indian Defense Research and Development Laboratory (DRDL) [48] Bharat Dynamics Limited (BDL) Indian Defence Research and Development Organization (DRDO)
Agni-4	ICBM	Indian Defense Research and Development Laboratory (DRDL) [49] Bharat Dynamics Limited (BDL) Indian Defence Research and Development Organization (DRDO)
Agni-5	ICBM	Indian Defense Research and Development Laboratory (DRDL) [50] Bharat Dynamics Limited (BDL) Indian Defence Research and Development Organization (DRDO)
Prithvi-1	SRBM	Integrated Guided Missile Development Program (IGMDP) [51] Indian Defence Research and Development Organization (DRDO)
K-15 (Sagarika)	SLBM	Defence Research and Development Organisation (DRDO) [52]
Dhanush	SRBM	Defence Research and Development Organisation (DRDO) [53]
?	Gravity bomb(s) [54]	?

According to Hans Kristensen from the Federation of American Scientists,
China, Israel, India, Russia and Pakistan have nuclear gravity bombs, but little detail is known.

Modernization

The primary focus of modernization has been on increasing the diversity, range, and sophistication of nuclear delivery vehicles.

In April 2012, India conducted its first test of Agni-V, with a range of over 5,000 km, and in January 2013, it conducted its first publicly announced test of a Submarine-Launched Ballistic Missile with a range of 700 km.[55] There is no reliable public estimate on nuclear weapon spending in India. Of the companies listed in this report, Bharat Electronics and Larsen & Toubro are contracted for components for the Indian nuclear arsenal.

Israel[56]

Estimates about the size of the Israeli arsenal are based on the power capacity of the nuclear reactor near Dimona. Experts estimate that Israel's current nuclear force ranges from 60–80 weapons at the low end[57] to over 400 at the high end.[58] The most frequently cited figure is 100–200 warheads.[59] It is assumed that Israel has a triad of delivery systems: land, air, and sea.

Nuclear arsenal

Name [60]	Type [61]	Producers
Jericho-2	MRBM	Israeli Aircraft Industries [62] MBT System and Space Technology Israel Military Industries Rafael
?	Gravity bomb(s) [63]	?

According to Hans Kristensen from the Federation of American Scientists,
China, Israel, India, Russia and Pakistan have nuclear gravity bombs, but little detail is known.

Modernization

In November 2005, Israel reportedly signed a contract worth USD1.17 billion with Germany for the construction of two more submarines, with the first one to be completed by 2012.[64] There is no reliable public estimate on nuclear weapon spending in Israel. ThyssenKrupp, is identified in this report as the company contracted to provide Israel with specifically designed nuclear capable submarines.

Pakistan[65]

Pakistan is currently estimated to have 90–110 nuclear weapons.[66] It has a number of short-range, medium, and longer-range road-mobile ballistic surface-to-surface missiles in various stages of development. It has developed a second generation of ballistic missile systems over the past five years.

Nuclear Arsenal

Name [67]	Type[68]	Producers
Abdali (Hatf-2)	SRBM	Space and Upper Atmosphere Research Commission (SUPARCO) [69] National Development Complex (NDC)
Ghaznavi (Hatf-3)	SRBM	Space and Upper Atmosphere Research Commission (SUPARCO) [70] National Development Complex (NDC)
Shaheen-1 (Hatf-4)	SRBM	Khan Research Laboratories (KRL) [71]
Ghauri (Hatf-5)	MRBM	Space and Upper Atmosphere Research Commission (SUPARCO) [72] National Development Complex (NDC)
Shaheen-2 (Hatf-6)	MRBM	National Development Complex (NDC) [73] State Administration for Science, Technology and Industry for National Defence (SASTIND)
Nasr (Hatf-9) [74]	SRBM	National Development Complex (NDC) [75] State Administration for Science, Technology and Industry for National Defence (SASTIND)
Babur (Hatf-7)	GLCM [76]	National Development Complex (NDC) [77]
Ra'ad (Hatf-8)	ALCM	Air Weapons Complex (AWC) [78]
?	Gravity bomb(s) [79]	?

According to Hans Kristensen from the Federation of American Scientists,
China, Israel, India, Russia and Pakistan have nuclear gravity bombs, but little detail is known.

Modernization

Pakistan has been rapidly developing and expanding its nuclear arsenal, increasing its capacity to produce plutonium and testing and deploying a diverse array of nuclear-capable ballistic and cruise missiles. Pakistan is moving from aircraft-delivered nuclear bombs to nuclear armed ballistic and cruise missiles and from liquid-fuelled to solid-fuelled medium-range missiles. Pakistan also has a growing nuclear weapons research, development, and production infrastructure.[80] There is almost no information about the funding of Pakistan's nuclear weapons programme, and none of the nuclear weapon producers identified in this report have contracts with Pakistan related to their nuclear arsenals.

Russian Federation[81]

Russia is estimated to have about 11,000 nuclear weapons: 2430 strategic and about 2000 non-strategic warheads that are considered operationally deployed; and about 3000 strategic and up to 3300 nonstrategic warheads awaiting dismantlement.[82] Russia's delivery vehicles include about 310 operationally deployed ballistic missiles of five different types that carry about 1000 warheads; nine submarines carrying 16 SLBMs each (in addition, two submarines are about to enter the force); and 67 heavy bombers capable of carrying as many as 800 air-launched cruise missiles.[83]

Nuclear Arsenal

Name [84]	Type [85]	Producers
R-36M (SS-18 Satan) (RS-20V)	ICBM	Yuzhnoye Design Bureau [86]
RS-18 (UR-100NUTTH) (SS-19 Stiletto)	ICBM	Salyut Design Bureau [87] NPO Mashinostroyeniya
RS-12M Topol (SS-25 Sickle)	ICBM	Moscow Institute for Thermal Technology (MITT) [88]
RS-12M1 Topol-M (SS-27 Mod. 1/mobile)	ICBM	Moscow Institute for Thermal Technology (MITT) [89]
RS-12M2 Topol-M (SS-27 Mod. 1/silo)	ICBM	Moscow Institute for Thermal Technology (MITT) [90]
RS-24 (Yars) (SS-27 Mod 2/mobile)	ICBM	Moscow Institute for Thermal Technology (MITT) [91]
RSM-50 Volna (SS-N-18 M1 Stingray)	SLBM	NPO Mashinostroyeniya [92]
RSM-54 Sineva (SS-N-23 M1 Skif)	SLBM	NPO Mashinostroyeniya [93]
RSM-56 Bulava (SS-N-32)	SLBM	Moscow Institute for Thermal Technology (MITT) [94]
Kh-55 (AS-15A Kent)	ALCM	Raduga Design Bureau [95] M.I. Kalinin MachineBuilding Plant
Kh-55SM (AS-15B Kent)	ALCM	Raduga Design Bureau [96] M.I. Kalinin MachineBuilding Plant
Raduga Kh-15 (AS-16 Kickback)	SRAM	Raduga Design Bureau [97] M.I. Kalinin MachineBuilding Plant
S-300P (SA-10 Grumble) (ABM)	ADM	Almaz ScientificProduction Association [98]
S-300V (SA-12 Gladiator/Giant)	ADM	Almaz ScientificProduction Association [99]
S-300PMU (SA-20 Gargoyle)	ADM	Almaz ScientificProduction Association [100]
53T6 (ABM-3 Gazelle)	ADM	Vympel NPO [101] Research Institute of Radio Instruments (NIIRP)
SSC-1B Sepal (ABM)	CDM	Chelomey Design Bureau [102]
Kh-22 Raduga (AS-4 Kitchen) [103]	ALCM	Raduga Design Bureau [104]
9K79 Tochka (SS-21 Scarab)	SRBM	Joint Stock Company KBM [105]
Iskander (SS-26 Stone)	SRBM	Joint Stock Company KBM [106]
?	Gravity bomb(s) [107]	?

According to Hans Kristensen from the Federation of American Scientists,
China, Israel, India, Russia and Pakistan have nuclear gravity bombs, but little detail is known.

Modernization

Russia's modernization plans indicate that it is determined to maintain parity with the United States in terms of number of warheads and delivery systems. Most of the currently operational ICBMs are being retired but new multiple-warhead missiles are

being deployed to replace them. The Russian government made a commitment to develop a new multiple-warhead liquid-fuel ICBM. There are no plans to modernize submarines. Russia will work on a new generation strategic bomber.[108] Modernization of the nuclear arsenal is part of a broader rearmament programme that is expected to spend about USD600 billion on various military systems in 2011–2020.[109] None of the nuclear weapon companies identified in this report were found to have contracts with the Russian Federation.

United Kingdom[110]

In September 2010, the UK government announced that it had "not more than 225" Trident nuclear warheads and that this would be reduced to "not more than 180" by the mid 2020s.[111] The UK's only delivery system is the Trident D5 missile. It is leased from the United States. Until 2010 each of the Vanguard class submarines carried around 12 operational D5 missiles. This will be reduced to 8 missiles per submarine over the next few years.[112]

Nuclear Arsenal

Name [113]	**Type** [114]	**Producers** [115]
Trident-II D5	SLBM	Lockheed Martin Alliant Techsystems Babcock International BAE Systems Babcock Marine RollsRoyce

Modernization

The UK is upgrading its current warheads in conjunction with the United States. Between 2015 and 2020 the UK will decide on the development of a new nuclear warhead. US modernization of the D5 missile system will apply equally to the missiles on British submarines. There is an expanding programme to develop a new submarine, to replace the Vanguard class.[116] The formal decision on whether to build the new vessels is due in 2016. Facilities at the Atomic Weapons Establishment (AWE) are being upgraded and annual expenditure at AWE has doubled to £1 billion per year. [117]

Annual expenditure on the UK nuclear weapons programme, which was £2.1 billion in 2010/11, is due to increase over the decade.[118] In accordance with current plans, in 2021, 35% of the MOD's core budget for capital expenditure will be spent on the Trident replacement.[119] Of the nuclear weapon companies identified in this report, Alliant Techsystems, Babcock International, BAE Systems, Honeywell International, Jacobs Engineering, Lockheed Martin, Roll-Royce, and Serco have current contracts related to the UK nuclear weapons arsenal.

United States[120]

Independent estimates place the total number of nuclear weapons in the active US stockpile at 4650.[121] These estimates indicate it also has approximately 3000 "retired" warheads, an unknown number of which are being maintained for possible reactivation. Independent estimates indicate the US stockpile has 500 non-strategic weapons with about 200 deployed at air bases in NATO countries in Europe.[122]

Nuclear Arsenal

Name [123]	**Type** [124]	**Producers** [125]
LGM-30G Minuteman III	ICBM	Boeing Northrop Grummam Alliant Techsystems GenCorp Lockheed Martin
UGM-133A Trident-II D5	SLBM	Lockheed Martin Alliant Techsystems GenCorp General Dynamics Honeywell International Raytheon Serco RollsRoyce
AGM-86B	ALCM	Boeing [126] Litton Guidance and Control

B61-7 [127]	Gravity bomb	Los Alamos National Laboratory (LANL) [128]
B61-11 [129]	Gravity bomb	Los Alamos National Laboratory (LANL) [130]
B83-1 [131]	Gravity bomb	Lawrence Livermore National Laboratory (LLNL) [132]
B61-3 [133]	Gravity bomb	Los Alamos National Laboratory (LANL) [134]
B61-4 [135]	Gravity bomb	Los Alamos National Laboratory (LANL) [136]
B61-10 [137]	Gravity bomb	Los Alamos National Laboratory (LANL) [138]

Modernization

The US government is officially committed to modernizing its nuclear bombs and warheads; the submarines, missiles, and aircrafts that carry them; and the laboratories and plants that design, maintain, and manufacture nuclear weapons. US policy and budget documents all manifest an intent to keep some thousands of nuclear weapons in service for the foreseeable future, together with the capability to bring stored weapons back into service and to design and manufacture new weapons should they be desired.[139] Furthermore, the US is refurbishing and upgrading many of the facilities where nuclear weapons are designed, tested, and manufactured, and is expanding its capacity to produce tritium (a relatively short-lived radioactive isotope used to boost the yield in nuclear weapons) using a commercial reactor.[140] US nuclear weapons and the associated systems are owned, managed and operated by an interlocking network of public agencies and private corporations. Of the companies identified in this report, Aecom, Alliant Techsystems, Babcock & Wilcox, Bechtel, Boeing, CH2M Hill, Fluor, GenCorp, General Dynamics, Honeywell International, Huntington Ingalls Industries, Lockheed Martin, Northrop Grumman, Rockwell Collins, SAIC and URS have contracts with the US nuclear weapon industry.

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