



**PAKISTAN'S NUCLEAR ASSETS  
AND THREATS OF TERRORISM:  
HOW GRAVE IS THE DANGER?**

**Zafar Ali**

*Visiting Fellow*  
The Henry L. Stimson Center

**JULY 2007**

Copyright © 2007  
The Henry L. Stimson Center  
1111 19<sup>th</sup> Street, NW  
12<sup>th</sup> Floor  
Washington, DC 20036

Telephone: 202-223-5956  
Fax: 202-238-9604

[www.stimson.org](http://www.stimson.org)

email: [info@stimson.org](mailto:info@stimson.org)

# TABLE OF CONTENTS

|   |    |
|---|----|
| Introduction.....   | 4  |
| The Issue .....   | 5  |
| Nuclear Terrorism: Defining the Threat .....  | 5  |
| Threat Scenarios.....   | 6  |
| Unfounded Concerns Over Nuclear Security in Pakistan.....   | 7  |
| How Does Pakistan Look at the Issue.....  | 8  |
| Ground Realities .....  | 9  |
| Theft of Nuclear Weapons or Fissile Material.....   | 9  |
| Vulnerability During Movement and War Time Deployment.....  | 10 |
| Accidental/Unauthorized Launch .....  | 11 |
| Theft of Nuclear Material and Radiological Sources .....  | 12 |
| Instability, Religious Extremism, and Coup.....   | 13 |
| Sabotage Against Nuclear Facilities and Concern Over Proliferation by Nuclear Establishment ..... | 14 |
| Priority Areas for Pak-US Bilateral Cooperation .....   | 15 |
| Conclusion .....  | 16 |



# PAKISTAN'S NUCLEAR ASSETS AND THREATS OF TERRORISM: HOW GRAVE IS THE DANGER?

by Zafar Ali<sup>i</sup>

## INTRODUCTION

In the wake of the terrorist attack on the World Trade Center, it was generally recognized that international terrorism and the possibility of use of Weapons of Mass Destruction (WMD) by terrorists and Non-State Actors (NSA) constituted a threat to all states. The rising threat and diffusion of instruments of mass destruction raised the possibility of nuclear/radiological terrorism and thus policy makers became more conscious of safety and security of materials/technologies that could be used by terrorists for mass destruction and effect. The potential for nuclear/radiological terrorism rises from different inter-related factors: global terrorism which does not recognize any boundaries, regional tensions and non-resolution of core issues of disputes, hegemonic policies and threatening the sovereignty of smaller countries, steady growth of nuclear arsenals, and the induction of new sophisticated weapons.

Potential dangers emerge from terrorists' acquisition of nuclear weapons or sabotage thereof; nuclear explosive devices using stolen nuclear materials; the use of radioactive sources as Radiological Dispersal Devices (RDDs); and radiological hazards caused by sabotage/attack on a nuclear facility or a transport vehicle. An effective strategy to prevent terrorists' access to and control of WMD should be based on two prongs: fighting terrorism/extremism on the one hand while on the other taking measures to secure nuclear weapons, material and other radiological sources. Some of the steps to thwart terrorists' efforts include: (i) revitalizing existing multilateral mechanisms, regimes, and treaties for their contribution to prevent terrorist activities; (ii) creating a comprehensive legal framework and international and national measures to control and account for all radiological sources, fissile material, and nuclear weapons particularly the loosely controlled fissile material in certain countries through "Cooperative Risk Reduction" measures; and (iii) enhancing capacity of states to implement their treaty obligations.

Over the past couple of years there has been a renewed emphasis by Washington and some Western countries that nuclear weapons and materials in South Asia especially in Pakistan are vulnerable to terrorists' or extremists' control—a seemingly deliberate effort to undermine the credibility of Pakistan's command and control. Let me admit that like any other country, Pakistan also faces terrorist threats from NSAs or extremist groups operating in the region and beyond; however, the dangers to nuclear assets and materials are not as grave as perceived in the West.

---

<sup>i</sup> The author is a Lieutenant Colonel with the Pakistan Army working in Pakistan's Strategic Plans Division. However, the views expressed in the paper are those of the author alone and do not necessarily reflect or represent the viewpoint of the Government of Pakistan, the Pakistan Army, or the Strategic Plans Division.

## **THE ISSUE**

Media reports on A.Q Khan's non-state network raised lingering suspicions, as a consequence overshadowing Pakistan's efforts to harness a coherent command and control system to manage its nuclear capabilities. The security environment of the region and the innate opacity and lack of information about the Pakistani nuclear program further provoke worries. Lecturing at the Naval Post Graduate School, the Director General of Pakistan's Strategic Plans Division said, "A large information gap and general lack of official communication about the Pakistani nuclear program had led to a snowballing effect of worry about the issues of safety and security of Pakistan's nuclear facilities, technology, and materials"<sup>1</sup>.

This paper provides a snapshot of Pakistan's nuclear realities nine years after the nuclear tests vis-à-vis threats of nuclear terrorism and efficacy of remedies placed to avoid recurrence of supervision lapses over nuclear material and radioactive sources. The paper also reflects on how Pakistan prioritized management over doctrinal issues of nuclear use and how it looks at the future of non-proliferation regimes, global nuclear threat reduction, and regional stability.

Because of the transnational nature of the threat, security of nuclear weapons, material and radioactive sources against terrorists and unauthorized person is a concern of all states. A comprehensive strategy that encompasses domestic, bilateral, regional, and international measures is essential to enhance cooperative threat reduction under the appropriate safeguards regime while promoting peaceful uses of nuclear energy. Although Pakistan has put in place effective remedies to prevent the recurrence of past malpractice, no nation can be satisfied as improvement is a continuous phenomenon. Reports of safety and security failures in many developed countries emphasize the need for constant improvement.

## **NUCLEAR TERRORISM: DEFINING THE THREAT**

The world over, there are 438 Nuclear Power Plants (NPPs) with several thousand fuel rods, 250 nuclear fuel cycle plants, more than 10,000 teletherapy sources with one Cobalt-60 capsule each, several tons of thousands industrial radiography sources<sup>2</sup>. According to a 2005 Carnegie Endowment report, there is a global stockpile of some 1,855 metric tons of plutonium in the world (1,700 tons in civil stocks and 155 tons in military), together with some 1,900 tons of HEU (175 tons civil and 1,725 tons military) – enough fissile material for about 100,000 nuclear weapons<sup>3</sup>. More than 130 research reactors still use HEU as their fuel, in more than 40 countries. Most of these facilities have very modest security — in many cases, no more than a night watchman and a chain-link fence<sup>4</sup>. So the environment is target rich all over the world in which Pakistan shares a small part of the target. As per the Institute of Science and International Security (ISIS) data on Global Stocks of Nuclear Explosive Materials, Pakistan possesses 0.884 tons out of the total world stock of 3870 tones<sup>5</sup>.

According to the IAEA, potential nuclear security threats (or, more accurately, nuclear security risks) emerge from: the acquisition of nuclear weapons by theft; the creation of nuclear explosive devices using stolen nuclear materials; the use of radioactive sources in radiological dispersal

devices; and the radiological hazards caused by an attack on, or sabotage of, a facility or a transport vehicle<sup>6</sup>. A May 2004 report by Harvard University's *Project on Managing the Atom* finds that a nuclear attack would be among the most difficult types of attacks for terrorists to accomplish, but that with the necessary fissile materials, "a capable and well-organized terrorist group plausibly could make, deliver, and detonate at least a crude nuclear bomb capable of incinerating the heart of any major city in the world"<sup>7</sup>. Media reports indicate terrorists' interest in seeking WMD; however, there are doubts if these organizations have the requisite expertise to acquire nuclear material, and convert them into deliverable devices. Threats of RDD or dirty bombs therefore appear more plausible, as also indicated by Steve Coll, who says, "The available evidence, then, suggests that while jihadi leaders might like to acquire a proper fission weapon, their pragmatic plans seem to run to dirty bombs – a more plausible ambition"<sup>8</sup>.

Significant security lapses have occurred in many nuclear weapon programs. The United States struggled through much of the 1970s and 1980s to develop a security system to adequately protect its nuclear weapons and weapon components. Yet, it still encounters difficulty in allocating enough resources to protect its nuclear weapons complex adequately. The former Soviet Union experienced a severe drop in the effectiveness of its nuclear security systems in the early 1990s. Russia, with the help of the United States and other countries, is now engaged in a massive effort to improve the security of its nuclear materials and weapons<sup>9</sup>. More alarming are unconfirmed reports on small fully built nuclear weapons gone missing from the Russian arsenal. In 1996, the Russian General Alexander Lebed claimed that 40 of these so called suitcase weapons were unaccounted for. He subsequently retracted the claim but in a manner that failed to reassure many experts<sup>10</sup>. Even in other countries, there are reports of theft and unauthorized removal of radioactive materials. In some cases the material involved highly radioactive isotopes<sup>11</sup>. More so, in India fissile material has been going missing and persons from the nuclear establishment have been blacklisted for alleged links with Iran<sup>12</sup>.

## **THREAT SCENARIOS**

The traditional approach to security was based on geographical boundaries; however, improvements in technology and globalization have widened security parameters, threats and the corresponding approach to deal with today's realities. Describing the threat, DG IAEA stated, "In the 20<sup>th</sup> Century, the advent of airplanes, submarines, ballistic missiles and weapons of mass destruction began to undermine this approach to security — by making borders increasingly porous and by enabling the remote delivery of destruction on a scale previously not envisioned"<sup>13</sup>. I agree that concerns about the ability of new nuclear states to adequately safeguard and secure their nuclear weapons and materials are logical to an extent as they have much work to do to learn and implement best practices. In the case of Pakistan, "the fear had been that the war on terrorism would be long drawn and could lead to complex situations for the US's Muslim country allies, particularly for Pakistan and Saudi Arabia. This accordingly in Pakistan's case could lead to a number of situations and scenarios where Pakistan could potentially lose control of its nuclear assets to radical forces or to theft by terrorists"<sup>14</sup>. Depending on how one looks at the issue, the potential nuclear terrorism threat can be shaped into any possible scenario including its use within or outside Pakistan. An incident involving sabotage of nuclear facilities would unleash lethal radiation causing human and financial suffering. Nonetheless, much of the Western

concerns revolve around the possibility that stolen material would be used against a mega city in the US or elsewhere. This raises many questions: will the terrorists be able to get away from the borders of Pakistan carrying dangerous nuclear material? How would they transport radioactive sources through airports/seaports and over long distances? Will they have the technical ability to handle the material? In the case of theft of a nuclear weapon, how would they get the electronic codes that activate the mechanism of the nuclear weapon? Will they possess the technical expertise to devise a suitable delivery system and transportation via land/sea/air? How will they cope with the hazards of handling unshielded radioactive sources?

At this point, it would be fair to conclude that very few terrorist entities are capable of or have shown significant interest in seeking nuclear weapons or material. There exist substantial road blocks to the acquisition of nuclear weapons and weapon-grade material; however, construction of a dirty bomb or RDD appears more plausible. Manifestation of any threat scenario would involve anyone of the following:

- Outsider Threat.
- Insider Threat.
- Insider/Outsider Threat: insiders and outsiders conspire together to obtain fissile materials, weapons, or weapon components.

## **UNFOUNDED CONCERNS OVER NUCLEAR SECURITY IN PAKISTAN**

Now let me turn to specific concerns that often appear in the Western media, and which cause suspicions over Pakistan's nuclear safety and security through publicizing some nightmarish scenarios depicting terrorist or extremist in control of Pakistan's nuclear weapons and material. To enumerate, these concerns are:

- Theft of a nuclear weapon or weapon-grade material by extremist or terrorist group.
- Vulnerability of nuclear weapons during war time, movement, and deployment.
- Some US experts say that domestic instability could make Pakistan's assets vulnerable and weaken the government's control over its nuclear arsenal whereby religious extremist could gain control over them. Specifically, concerns that Pakistan could suffer another coup and that a radical leadership would place a high priority on seizing nuclear weapons.
- Worries that experts from the nuclear complex could steal sensitive information or assist nuclear weapons program of other countries or terrorist groups.
- Sabotage against nuclear facilities and NPPs possibly with an insider assistance.
- Some analysts raise concerns on accidental or unauthorized launch of nuclear weapons. A Congressional Research Service (CRS) report of February 2005 says "Simply put, there are two basic nuclear risks in South Asia: first, that terrorist will acquire nuclear material or nuclear weapons, and second, that nuclear war will erupt through miscalculation, through preemption, or through sudden escalation<sup>15</sup>. On the contrary, some view that the situation of South Asia is different from Russia and offers one major complication: threat reduction measures aimed at outside/terrorists' threat may conflict with nuclear deterrence. For example, making material and weapons safe from theft or espionage may logically lead to consolidating material

and weapons at as few sites as possible. However, that consolidation could increase one's vulnerability to a pre-emptive strike by an adversary<sup>16</sup>.

## **HOW DOES PAKISTAN LOOK AT THE ISSUE**

The ongoing controversy over Iran and North Korea aside, Pakistan and Russia are perceived as target countries suspected for loose nuclear controls and other varying reasons. Russia inherited nuclear weapons and material from Former Soviet Union, which had one of the world's largest stockpiles of fissile material and nuclear weapons. Because Russia is awash with orphan radiological sources and it has a weak record of material protection, control, and accounting – there are reported cases of theft involving nuclear material, so the fears have a logical foundation. Separatist and extremist movements within Russia and Central Asian States further raise the specter of threat and worry that terrorists could gain access to sensitive materials or a large pool of surplus nuclear experts. The question arises as to why Pakistan is regarded as suspect. In my reckoning there are three reasons; firstly, the legacy of A.Q. Khan's proliferation network, secondly; Pakistan's proximity to the region where Al Qaeda and Taliban remnants are located; and thirdly because of religious conservatism in Pakistani society. Pakistan's nuclear assets are under custodial control and weak links in management and oversight have been addressed to prevent the recurrence of any proliferation activity. While Al Qaeda and Taliban have no direct bearing on Pakistan nuclear assets, the threat from their affiliates and extremist groups is genuinely worrisome. Pakistan's responses to tackle potential challenges from these groups are illustrated in next part of the paper. Nevertheless, instances of illicit trafficking of nuclear material and loss of control over nuclear assets in other countries should not be made a basis to raise suspicions over Pakistan's nuclear assets.

Disregarding Pakistan's genuine security concerns and threats to its survival; it was treated as a step child and placed under technology denial regimes since the beginning. Feroz Hassan Khan of the Naval Post Graduate School says, "The United States failed to prevent Pakistan from building nuclear weapons because U.S. officials never fully grasped Pakistan's perception of its security situation relative to India, especially after the 1971 Bangladesh war"<sup>17</sup>. It had to acquire nuclear capability through circumventing these denial regimes. Faced with the Western countries' unwillingness to share their best practices and assist in safety and security matters, Pakistan had to learn on its own with dependence on human reliability as an expected consequence of technology denials. However, to allay lingering concerns over its nuclear prowess, Pakistan chose as a first step after the nuclear tests of May 1998, to put in place a well structured command and control system (the National Command Authority with a number of subsidiary organizations was thus created).

Rumors of preemptive or preventive action by India or Israeli or US forces create a worrisome situation for Pakistan. In the words of George Perkovich, "Rumors of an Indian or even Israeli preemptive attack on Pakistani nuclear weapons capabilities have erupted in Pakistan predictably during crises"<sup>18</sup>. Strategizing preemptive or preventive use of force has potentially dangerous consequences for security, stability, and peace. Several observers have suggested that if Pakistan suffers a coup by forces hostile to the United States, the US military should be ready to provide security over the nuclear weapons (or even to take the weapons out of Pakistan entirely) without

the permission of the Pakistani authorities....Although such responses appear possible in theory, their implementation could be extremely difficult and dangerous. A U.S. military action to seize or cripple Pakistan's strategic nuclear assets may encourage India to take similar action, in essence to finish the job<sup>19</sup>. Using NSAs as a pretext for preemption undermines state sovereignty and violates Article 51 of the UN Charter. In the context of South Asia, this would be a major destabilizing factor. Maria Sultan, Director South Asian Strategic Stability Institute, London, says "This reversion to *realpolitik* combined with the threat of nuclear, chemical and biological weapons terrorism, continued regional instability and the existence of revisionist powers in various security complexes increases the potential for instability the world over<sup>20</sup>. On the other hand, conceptualization of preemptive attacks has led to more redundancy measures. "Such threats have only galvanized Pakistan into ensuring greater survivability of its nuclear production facilities, operational forces, and command structure", says Feroz Hassan Khan<sup>21</sup>.

## **GROUND REALITIES**

As a responsible steward of its nuclear capability, Pakistan should consider: what more can be done to ensure the security of nuclear assets against all possible threats. Its renewed strategic partnership with US and frontline role in the global war against terrorism elevate dangers to sensitive materials. The geo-political environment and maintenance of strategic stability present other challenges. In a sense it should be reassuring that there has been no reported case of security failure subsequent to the A.Q Khan's case. But is it because of tight security or lack of interest by terrorists thus far, is a question. This part of the paper underscores Pakistan's responses to alleviate perceived dangers against terrorists' threats and prioritizes areas for advancing safety and security of nuclear assets and other radioactive materials.

## **THEFT OF NUCLEAR WEAPON OR FISSILE MATERIAL**

Most analysts are of the view that states would closely guard their nuclear assets against access by NSAs and terrorist groups. The smaller size of Pakistan's nuclear assets and facilities decrease the chances of theft as these could be easily secured and guarded. In contrast, a larger nuclear establishment and the possession of nuclear materials would correspondingly present more targets and thus more vulnerability. Nevertheless, a comprehensive security structure, in either case, should encompass both technical and non-technical measures for safety, security and survivability of nuclear weapons and sensitive materials during peace, crisis, and war time. In the case of Pakistan, strategic organizations are under the state control where security paraphernalia is comparatively tighter than at private entities whose corporate interests influence their policies/actions on management of nuclear facilities and materials.

IAEA experts' say it is highly unlikely that terrorist could use nuclear material to manufacture and successfully detonate a nuclear bomb. The difficulties of manufacturing a nuclear explosive device are not the personnel with knowledge but the huge engineering and industrial challenge of creating fissile material<sup>22</sup>. Road blocks for terrorists to fabricate a deliverable device include: relevant knowledge and expertise; requisite equipment and material; states' security apparatus; manufacturing a suitable delivery mechanism; and diagnostic and test facilities. The case of Iran

illustrates these road blocks – despite all of a state’s resources at its disposal, it is reportedly several years away from a bomb.

To prevent theft of nuclear material, nuclear facilities employ a range of protection measures including site security forces, site access control, employee screening, and co-ordination with local and national security authorities. Pakistan is a state party to the Convention on Physical Protection of Nuclear Material (CPPNM), the Convention on Nuclear Safety, and has an elaborate legal framework to ensure implementation of United Nations Security Council Resolution-1540 (UNSCR-1540). All safeguarded facilities are inspected regularly by IAEA inspectors and thus far there is no deviation from laid down procedures. It has been widely reported that Pakistan keeps its nuclear and non-nuclear components of the nuclear weapons, separate. If true, this measure would greatly complicate efforts to seize an intact device and might also complicate the diversion of fissile material in the form of weapon components, since, presumably these receive the highest possible security within the Pakistani system<sup>23</sup>. Commenting on nuclear weapons security, CRS report (RL-31589) on *Nuclear Threat Reduction Measures for India and Pakistan*; observes, “Fissile material components (pits) are thought to be kept separately from the rest of the warhead. Such a physical separation helps deter unauthorized use and complicates theft”<sup>24</sup>.

Credible institutional controls should not be allowed to breed complacency; rather the security apparatus should continuously be upgraded to thwart emerging/potential threats. Personnel Reliability Program (PRP) should be expanded as an essential element to detect and prevent insiders’ malevolent intent.

## **VULNERABILITY DURING MOVEMENT AND WAR TIME DEPLOYMENT**

Security during normal peace time environment is at its best. However, threats during crisis and war time take a different turn and fall under the ambit of strategic stability. While the level of alert and security against possible terrorist threats procedurally rises during crisis and war time situations, implied dangers from accidents, unauthorized launch, preemptive attack and inadvertent escalation become pronounced. Being relatively new entrants in the arena, both India and Pakistan lack real-time warning and surveillance capabilities and efficient communication mechanism, which is essential for crisis management. This limitation in technical surveillance and real time information also increases the chances of decisions being made on faulty premises. Geographical contiguity puts the two into an awkward state as compared to US and Soviets during the Cold War.

Given domestic political compulsions and the necessity to be battle effective, force deployment becomes necessary during crisis, for a just-in-case situation. Nuclear force deployment in a deepened crisis and unfolding conventional war becomes an operational necessity. Such deployment is not necessarily carried out for any offensive intent, but for ‘just-in case’ probabilities.... In particular, concerns of crisis management are overlaid on a command-and-control arrangement that faces difficult transitions to cope with rapid and sudden changes from

peace, to crisis, to war<sup>25</sup>. However, a "just-in-case" capability and a "ready-for-use" capability intermingle as weaponization proceeds.

Peace and peace-dividends in South Asia cannot emerge as a result of external impositions or pressures. For nuclear stability in the region, both India and Pakistan should work to establish a regime of restraint, crisis management and risk reduction. Nonetheless, US and other countries could share their best practices and render technical assistance in modernizing command and control systems, surveillance and technical information gathering capabilities of the two countries. Remaining mindful of its responsibility as a nuclear power, Pakistan initiated a Composite Dialogue Process with India and entered into various bilateral agreements including, but not limited to, up-gradation and establishment of hotline, an agreement to prevent attacks on nuclear installations and facilities, pre-notification of ballistic missile tests, and an agreement to prevent unauthorized/accidental launch of nuclear weapons. This process may be expanded to bring in more transparency and confidence over their capabilities.

Although de-mated status, separate storage, secure and camouflage deployment sites is a semblance of safety and security but given the challenges of strategic stability, improvements in technical means can not be ignored. Elaborate Standing Operating Procedures and physical protection arrangements provide fairly effective defense against possible terrorist threats. Pakistan's strategic forces possess enough manpower and weaponry to effectively guard against ground and aerial threats during movement, crisis and deployment. Persons familiar with operational procedures of military organizations and formations could well understand the measures that are part of standing procedures. Reportedly, Pakistan has incorporated some technical safety features into weapon design to ensure the safety of nuclear weapons.

## **ACCIDENTAL/UNAUTHORIZED LAUNCH**

Given the absence of a comprehensive crisis management system between India and Pakistan, accidental or unauthorized launch can result in an imperfect decision by the adversary. This is a matter of nuclear safety that involves procedures to prevent unauthorized access, as well as physical security and technical safety measures to ensure positive control of nuclear weapons. As pointed out in the preceding paragraphs, Pakistani nuclear weapons are in de-mated status with warhead and fissile cores stored separately; and, besides other physical security measures, the technical design features supplement safety against accidental or unauthorized launch. In a guest lecture at the Naval Post Graduate School on November 27, 2007 Director General Pakistan Strategic Plans Division said "Pakistani nuclear controls include some functional equivalent to the two-man rule and Permissive Action Links (PALs) that the United States and some other nuclear-weapons states rely on to protect against loss of control, inadvertent weapons use, accidents, and other mishaps<sup>26</sup>. Both India and Pakistan face nuclear command and control challenges somewhat similar to US and FSU during the early decades of Cold War. However, the crisis prone environment of South Asia makes issues of command and control important particularly during the crisis situation.

The security set up arranged since beginning of the program was designed to protect it from outside interference, spying, and physical threats (including sabotage). These measures have been

reinforced since the 1998 nuclear tests through multiple means including technical and non-technical. Acknowledging this Peter Lavoy writes, “Since the 1998 tests, various pronouncements, publications in the Western press, and events in the region have eroded the credibility of Pakistan’s nuclear command and control, overshadowing the efforts that have been made since 1999 to harness a coherent command system to ensure management of its nuclear capabilities.... One effect of Pakistan’s decades old fears of preventive strikes against its nuclear complex has been a very high priority placed on the survivability of all nuclear production facilities, weapons and missile storage complexes and potential launch facilities”<sup>27</sup>.

## **THEFT OF NUCLEAR MATERIAL AND RADIOLOGICAL SOURCES**

While it is generally believed that the level of security at nuclear facilities and at sites/storages containing nuclear weapons or material (Reactor or weapons-grade Highly Enriched Uranium-235 or separated Plutonium-239) is high, security of industrial radiation sources; medical, agriculture and engineering use radioactive isotopes is comparatively weak in many countries. Commercial radioactive sources are of enormous benefit; however, if not secured adequately some of these sources could fall into wrong hands for malicious use. Terrorists’ interest in a RDD may make any or all radioactive sources potentially attractive to steal. While RDD terrorism seems a more plausible threat; appropriate governmental regulatory control over potentially dangerous radioactive sources offer some road blocks against illicit acquisition. Once terrorists have obtained radioactive material, they still have to fulfill several logistical requirements before they actually carry out an act of radiological terrorism, such as: knowledge about the targeted facility; provision of adequate manpower and vehicles to transport the source; access to tools for dismantling the source<sup>28</sup>.

Pakistan Nuclear Regulatory Authority (PNRA) controls, regulates, and supervises all matters related to nuclear safety and radiation protection in Pakistan. It has formulated rules, regulations, and guidelines in all aspects of nuclear safety and radiation protection so as to prevent loss, theft, damage, and to prevent any unauthorized transfer or access to the sources. Appropriate steps have been taken for the last 20 years to ensure a proper track of all radioactive sources imported into Pakistan. “Less than 6% of these sources fall within the radioactive sources classifications of category 1 and 2 of IAEA.... All the radioactive sources are under strict regulatory control right from import until their disposal”<sup>29</sup>. Security of radioactive sources is ensured through periodic physical verification and regulatory inspections. PNRA has also initiated, toward the last quarter of 2006, a five year Nuclear Security Action Plan (NSAP) to establish a more robust nuclear security regime. It seeks capacity building in Pakistan’s ability to plan for, respond to, and recover from terrorist incidents in collaboration with relevant governmental agencies. Efforts are in hand to ensure effective security of all radioactive sources that are being used in industry, agriculture, R&D, medical, and other sectors. The US Department of Energy (DoE) and PNRA are pursuing collaborative measures in this context.

## **INSTABILITY, RELIGIOUS EXTREMISM, AND COUP**

The fear of the Islamist threat has influenced most Western countries’ foreign policies towards Pakistan. Apparently, these concerns draw analogies from conservative ideas of a small segment

of Pakistani society and the presence of Taliban sympathizers in remote parts of the tribal areas in North West Frontier Province of Pakistan particularly North and South Waziristan. The influence of these elements is restricted to remote areas where the literacy rate is low and civic infrastructure is less developed.

The overwhelming majority of Pakistani society consists of moderates who reject extremism. Michael Krepon of the Stimson Center, Washington, says, "Pakistan has not been a revolutionary state to date, and the mullahs have not made deep inroads in the political life of the country"<sup>30</sup>. Religious parties are politically oriented and there is no rhetorical desire to take over nuclear facilities or to brandish nuclear weapon as Islamic bomb. President Musharraf in his memoir *In the Line of Fire*, says:

No one else's bomb is called Hindu, Jewish, Christian, capitalist, or communist, yet somehow our bomb becomes "Islamic", as if that makes it illegitimate. The idea is illogical and essentially racist. This is an example of how Muslims continually feel unjustly singled out and alienated<sup>31</sup>.

Religious parties have not been able to draw electoral support which historically varied between 5-8%. However, in the October 2002 elections, they were able to gain 11.10% of total votes – trailing far behind other parties like Pakistan Peoples Party, Pakistan Muslim League (Nawaz), and Pakistan Muslim League (Quaid-e-Azam). This surge is attributed to many factors like the situation in Afghanistan, the US attack on Afghanistan, internal divisions within other political parties and formation of a political alliance by the six religious parties. Frederic Grare, visiting scholar at Carnegie Endowment for International Peace says, "No objective observer believes that Pakistan's Islamic parties have a chance to seize power through elections in the foreseeable future"<sup>32</sup>.

Thus far there is no report of theft involving nuclear material or radioactive sources in Pakistan - neither has there been any attempt by extremist or terrorist element to gain access to nuclear weapons or material. Guarav Kampani says, "Despite such speculative scenario building among policy and security analysts, there is little public evidence to suggest that the safety or the security of Pakistan's nuclear installations or its nuclear command and control mechanism was ever in jeopardy from internal political instability or Islamists or terrorists forces inside Pakistan or nearby in Afghanistan, either during the American 'War against Terrorism' in Afghanistan or during the 2001-2002 India-Pakistan military Standoff"<sup>33</sup>. In their analysis of threats from Islamic fundamentalism, Scott Parrish and William C. Potter of the WMD Commission opine, "As a result, while many states may view Islamic fundamentalism as a significant threat, there appears to be much less agreement on the nature of that threat and its relationship to nuclear terrorism or proliferation"<sup>34</sup>.

The frightening thinking that alleged extremists in the military establishment would stage a coup and seize control of nuclear weapons is simply an over-stretch. Historically, the military has remained Western leaning, and often criticized by extremist groups for its Western orientation. It is an organized institution, which follows the norms of a set discipline. A well established system

exists for recruitment, psychological tests, screening, promotion and appointments; thus the assumption that military would fall prey to extremist ideology may not be justified. On the question of division or coup from within the Army, General @ Talat Masood's remarks would amply clarify the situation, who says, "I see no division which should be a cause of any serious alarm .... The one possibility is that if the war becomes protracted and if there are a lot of civilian casualties in Afghanistan, it could arouse passions among the civilians and give rise to differences within the military"<sup>35</sup>. Assuming if there is a coup; it should logically be for over-throwing the regime and gaining power and not seizing nuclear weapons from an outside power. An institutional mechanism exists to control all strategic assets irrespective of who is in power.

## **SABOTAGE AGAINST NUCLEAR FACILITIES AND CONCERN OVER PROLIFERATION BY NUCLEAR ESTABLISHMENT**

Issues of sabotage and proliferation mostly relate to the reliability and trustworthiness of scientists, technicians, and others who work in the nuclear establishment. Referring to the initial challenges, Director General Pakistan Strategic Plans Division has said, "Following Pakistan's May 1998 nuclear tests, the Pakistani nuclear program faced three major challenges: (1) the need to manage the nuclear program in an institutional way, (2) the need to review the range of national security policies, and (3) the need for an effective and prudent force development strategy"<sup>36</sup>. Creation of NCA, PNRA, Security Division, Strategic Force Command, promulgation of relevant laws, and setting up systems for the effective monitoring of strategic organizations are steps to meet the potential challenges. Not a single incident of leakage of nuclear material, components or technology has come up since NCA came into existence. Most recently, the government has also approved the creation of a Strategic Export Control Division for effective administration of export control laws on sensitive technologies and material. This is how Pakistan has moved on management of its nuclear capability.

In response to the embarrassment caused by A.Q Khan's role in the nuclear black market, the Pakistani government has initiated a series of measures to exercise tighter control and management of its nuclear assets and to prevent tangible and intangible transfers of sensitive technologies and material. The over 8000 men strong Security Division guards against malevolent activities and keeps a close watch on the misuse of information or leakage of technology. President Pervez Musharraf in his memoir asserted, "In February 2000, our strategic weapons program came under formalized institutional control and thorough oversight, duly approved by my government"<sup>37</sup>.

Personnel reliability measures also include training of enforcement agencies and the removal of individuals tainted by recent events from sensitive posts within the nuclear establishment. May it also be highlighted that civilian NPPs are under facility specific IAEA safeguards, which follow the IAEA guidelines on safety and security. Notwithstanding this, there is a need to expand and formalize the PRP in all relevant organizations dealing in sensitive technologies. US technical assistance and sharing of information can hasten that process.

## **PRIORITY AREAS FOR PAK – US BILATERAL COOPERATION**

The Pakistani nuclear establishment generally appears confident over the management and security of nuclear assets; however, the various measures largely remain untested. In a dynamic threat environment, the need to constantly improve and stay a step ahead of terrorists' plans needs no emphasis. A frequently quoted rule-of-thumb is that security needs to constantly improve in order to stay one step ahead of would-be thieves<sup>38</sup>. Because all states with nuclear weapons must be responsible stewards, and because no complacency is acceptable and improvements are always warranted, the following measures might well be considered:

To enhance Detection, Prevention, and Response capabilities, assistance in expanding the PRP may provide new nuclear states with greater certainty about their positive and negative controls. Although Pakistan is following a model of PRP; however, US assistance and experience might be useful in creating the proposed Personnel Reliability Training Academy (PRTA) in Pakistan.

Strengthening institutional capacity for crisis management and mitigating the consequences of a nuclear related incident is another aspect that should be the focus of attention. Expanding PNRA's technical capacity for implementing the NSAP would enable an efficient response to incidents of radiation hazards, management of consequences and attribution.

Because terrorism is not a Christian, Buddhist, Jewish or a Muslim belief, it is to be condemned no matter who the perpetrator may be. Continued dialogue and cooperative efforts are essential to develop a common strategy and to prevent terrorists' access to sensitive materials. Effective mechanism against terrorists' threat requires unilateral, bilateral, and international arrangements. For regional stability, both India and Pakistan could evolve a strategic restraint regime (covering both nuclear and conventional forces) while drawing pertinent lessons from the Cold War model, albeit South Asia has peculiar geo-strategic environment and, is not a U.S-USSR model in the classic sense with weapons on hair triggers. To carry forward the ongoing Composite Dialogue Process, the following may be considered as next steps:

- Establish Nuclear Risk Reduction Centers.
- Extend the existing agreement on pre-notification of ballistic missile testing to cruise missiles.
- An agreement not to produce and deploy tactical nuclear weapons.
- Lay out comprehensive procedures for authorized use.
- Establish a procedure to deal with false warnings.
- Launcher and warhead separation to mutually agreed geographical locations.
- Move towards conflict resolution.
- Keep the communication channels open during peace as well as crisis situations.

At the international level, negotiating a non-discriminatory and universal treaty on preventing NSAs' access to WMD and components thereof would constitute a long term measure to block terrorists' access to such sensitive materials. Alternatively, existing treaty regimes could be strengthened specifically for this purpose. New nuclear states could benefit from technical assistance to improve safety and security of their nuclear weapons and material.

However, there appears a sense that making weapons more safe would result in their concentration at a few sites and allow for more deployable tendencies. It is doubtful if such a policy could have substantial impact when the countries are known nuclear powers. There is a need to de-link the issue of nuclear safety from nuclear proliferation and redefine the non-proliferation regime in a more realistic manner<sup>39</sup>.

Promote the concept of twinning between various agencies of the two countries. The exchanges will enhance mutual respect and understanding between technical and non-technical communities in both the US and Pakistan, which is critical for sustaining long term relationship. Twinning between PNRA and USNRC (United States Nuclear Regulatory Commission) could be the first step, which could later be expanded to encompass other agencies of the two countries. Sharing information between nations and agencies should be expanded, if not officially, then at least informally.

## CONCLUSION

Pakistan is a forward looking state which rejects terrorism in all its forms and manifestations. Its nuclear assets are safe and can not fall into extremists or terrorists' control. Refuting concerns over security of Pakistan's nuclear weapons, Michael Krepon of the Henry L. Stimson Center told CBS News, "If the Chinese government could maintain control of its nuclear weapons during the Cultural Revolution, Pakistan's military can also maintain close watch and control over its nuclear crown jewels.... The odds are still heavily in favor of the military maintaining strict command and control"<sup>40</sup>. Pakistan has a well structured command and control system, supports non-proliferation efforts at various international forums and actively participates in IAEA technical cooperation programs. It is a party to 11 out of the thirteen UN conventions and protocols on terrorism. Pakistan is a party to CPPNM (entered into force in 1987, and designed to protect nuclear material in transit within and between the countries. CPPNM defines a range of nuclear terrorist activities and requires parties to criminalize those activities). Pakistan is a member of the Convention on Nuclear Safety, Code of Conduct on Radiological Safety and other international treaties and regimes. It has been at the forefront during negotiations on UNSCR-1540, and its export control law on sensitive material and technology is aligned with international standards and the non-proliferation regime.

The induction of new and sophisticated weapons in South Asia is destabilizing as it could initiate a spiral of arms race. It is in Pakistan's interest to reduce asymmetry in conventional forces to keep the nuclear threshold high. Commenting on the influence of developments in Indian defense capabilities, Peter Lavoy of NPS points out, "The basic point is that projected developments in India's nuclear and conventional military capabilities eventually could threaten the survivability of Pakistan's strategic deterrent, which has always been a major concern for the country's defense planners"<sup>41</sup>. The U.S-India civil nuclear deal is an unhelpful development, since it creates an exception to non-proliferation rules and norms based on one country, rather on specific criteria or energy needs.

Nuclear weapons accidents have happened in the past and they will undoubtedly occur in the future. It has been reported that between the United States, Great Britain, France, and the former

Soviet Union, there have been 230 nuclear accidents”<sup>42</sup>. The new salience of the nuclear terrorism threat must transform the security thinking and approach to harmonize security and safety standards in all countries because of the transnational nature of this threat. The long-term solution to terrorism lies in the commitment to maintain the balance of power, strengthen relevant multilateral regimes and treaties, negotiate new agreements to fill any perceived legal gaps, enhance the capacity of states to implement their treaty obligations, check hegemonic aspirations, and guarantee the just resolution of disputes around the world. States need to recognize that the safety and security of nuclear weapons, material, and dangerous radioactive sources is a legitimate concern, which require measures at unilateral, bilateral and international levels.

- 
- <sup>1</sup> Director General Pakistan's Strategic Plans Division (SPD) Guest Lecture at Naval Postgraduate School, 27 October 2006, Organized by the Center for Contemporary Conflict.
- <sup>2</sup> Fritz Steinhausler and George Bunn, *Securing Nuclear Material and Strong Radiation Sources*, IAEA Bulletin, Vol 45/1, June 2003.
- <sup>3</sup> Carnegie Endowment for International Peace, *Universal Compliance: A Strategy for Nuclear Security* (Washington, DC: CEIP), March 2005, pp. 86, 91.
- <sup>4</sup> Matthew Bunn & Anthony Wier, *Securing the Bomb 2006*, p. viii. Available at <http://cstsp.aaas.org/files/stb06webfull.pdf>.
- <sup>5</sup> “This includes Pl, HEU, Np-237 and Am”. For details and information on other countries see [http://www.isis-online.org/global\\_stocks/end2003/summary\\_global\\_stocks.pdf](http://www.isis-online.org/global_stocks/end2003/summary_global_stocks.pdf).
- <sup>6</sup> Statement of Director General IAEA at the Asia-Pacific Nuclear Safeguards and Security Conference, Australia, November 8, 2004.
- <sup>7</sup> Matthew Bunn and Anthony Wier, *Securing the Bomb: An Agenda for Action*, Project on Managing the Atom, Harvard University, May 2004, p. vii. Available at [[http://www.nti.org/e\\_research/analysis\\_cnwmupdate\\_052404.pdf](http://www.nti.org/e_research/analysis_cnwmupdate_052404.pdf)].
- <sup>8</sup> Steve Coll., *The Unthinkable: Can the United States be made safe from Nuclear Terrorism*, The New Yorker, Issue of March 12, 2007, p.4.
- <sup>9</sup> <http://www.isis-online.org/publications/terrorism/stanleypaper.html>.
- <sup>10</sup> <http://www.bmj.com/cgi/content/full/324/7333/356>
- <sup>11</sup> IAEA database on illicit trafficking available at [www.iaea.org/NewsCenter/Features/RadSources/PDF/itdb\\_31122004.pdf](http://www.iaea.org/NewsCenter/Features/RadSources/PDF/itdb_31122004.pdf)
- <sup>12</sup> Dr. Shireen M. Mazari & Maria Sultan, *Nuclear Safety & Terrorism: A Case Study of India (2001)*, available at <http://www.issi.org.pk/islamabad.html>
- <sup>13</sup> Ibid.
- <sup>14</sup> Maria Sultan & Dr Zulfiqar Khan Chaudhry, *Safety and Security of Pakistan's Nuclear Arsenal: A Critical Appraisal*, South Asian Strategic Stability Institute, London Research Report No 11, (June) 2007.
- <sup>15</sup> CRS Report Order RL 31589, Feb 17, 2005, page 10.
- <sup>16</sup> Ibid, p. 9.
- <sup>17</sup> Feroz Hassan Khan, *Nuclear Proliferation Motivations: Lessons from Pakistan*, Routledge, Nonproliferation Review, Vol. 13, No 3, November 2006
- <sup>18</sup> According to George Perkovich, this occurred in the 1982 and 1990 crises, and the period in 1998 before Pakistan tested its nuclear devices. See Perkovich's remarks at September 23, 2001 Carnegie Endowment roundtable on “Pakistan's nuclear dilemma.”
- <sup>19</sup> David Albright, *Securing Pakistan's Nuclear Weapons Complex*, Strategies for Regional Security (South Asia Working Group), October 25-27, 2001, Airlie Conference Center, Warrenton, Virginia.
- <sup>20</sup> Maria Sultan & Dr Zulfiqar Khan Chaudhry cited ibid.
- <sup>21</sup> Feroz Hassan Khan cited ibid.
- <sup>22</sup> Christopher O. Clary's Naval Post Graduate Thesis, *The A.Q. Khan Network: Causes and Implications*, December 2005. P. 26, Available at <http://www.fas.org/irp/eprint/clary.pdf>.

- 
- <sup>23</sup> David Albright, “Securing Pakistan’s Nuclear Infrastructure,” in *A New Equation: U.S. Policy Toward India and Pakistan after September 11*, Carnegie Endowment for International Peace, Working Papers, Number 27, May 2002.
- <sup>24</sup> CRS Report cited *ibid*.
- <sup>25</sup> Feroz Hassan Khan, *Nuclear Command and Control in South Asia during Peace, Crisis and War*, Routledge, Contemporary South Asia, June 2005.
- <sup>26</sup> Director General Pakistan’s Strategic Plans Division (SPD) guest lecture cited *ibid*.
- <sup>27</sup> Peter R. Lavoy, *Pakistan’s Nuclear Posture: Security and Survivability*, p.11-12, Available at <http://www.npec-web.org/>.
- <sup>28</sup> Rajesh M. Basrur & Friedrich Steinhausler, *Nuclear and Radiological Terrorism Threats for India: Risk Potential and Countermeasures*, p.2. Available at [http://jps.lanl.gov/vol1\\_iss1/3-Threats\\_for\\_India.pdf](http://jps.lanl.gov/vol1_iss1/3-Threats_for_India.pdf).
- <sup>29</sup> Abdul Mannan, Visiting Fellow The Henry L. Stimson Center, *Preventing Nuclear Terrorism in Pakistan: Sabotage of a Spent Fuel Cask or a Commercial Irradiation Source in Transport*, Available at <http://www.stimson.org/southasia/pdf/VFMannan.pdf>.
- <sup>30</sup> Michael Krepon talks to CBS News March 2007, Text available at <http://www.stimson.org/print.cfm?pub=1&ID=401>.
- <sup>31</sup> *In the Line of Fire*, A Memoir of Pervez Musharraf, Simon & Schuster, 2006, p-288.
- <sup>32</sup> Frederic Grare, *Pakistan: The Myth of an Islamist Peril*, Carnegie Endowment for International Peace, Policy Brief No 45, February 2006.
- <sup>33</sup> Gaurav Kampani, ‘Safety Concerns About The Command & Control of Pakistan’s Strategic Forces, Fissile Material, and Nuclear Installations’, CNS Special Section : Terrorist Attacks on America, Monterey Institute of International Studies, September 28, 2001,
- <sup>34</sup> Scott Parrish and William C. Potter, *Nuclear Threat Perceptions and Nonproliferation responses: A Comparative Analysis*, Weapons of Mass Destruction Commission Report No 36.
- <sup>35</sup> The New York Times, October 1, 2001, *US and Pakistan Discuss Nuclear Security*.
- <sup>36</sup> Director General Pakistan’s Strategic Plans Division (SPD) guest lecture cited *ibid*.
- <sup>37</sup> *Ibid*, p-289.
- <sup>38</sup> *Ibid*.
- <sup>39</sup> Shireen M. Mazari, *Nuclear Safety vs Non-Proliferation*, Strategic Studies 20 (Autumn 2000), p-6.
- <sup>40</sup> *Ibid*.
- <sup>41</sup> *Ibid*.
- <sup>42</sup> Z. Mian, M. V. Ramana, and R. Rajaraman, *Risks and Consequences of Nuclear Weapons Accidents in South Asia*, PU/CEES Report No. 326, September 2000, Available at <http://www.princeton.edu/~globsec/publications/pdf/report326.pdf>.
-