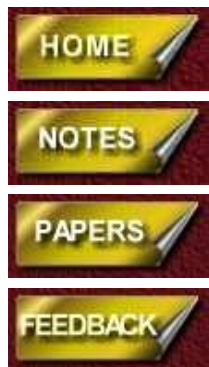




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Nuclear Terrorism: *Relevance and Prospects in South Asia*

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Recent events in the South Asian neighborhood , where the U.S. is involved in a long campaign including bombing of Afghanistan, against international terrorism has seriously raised the prospect of terrorists resorting to Nuclear, Biological, Radiological or Chemical (NBRC) attacks both as a revenge and intimidatory tactics against nations cooperating with the U.S. in the anti terrorist campaign against them.

The increasing salience of religious motives for terrorist activity has already contributed to increasing lethality of international terrorism. The religious terrorists are most likely to use Weapons of Mass Destruction (WMD) free as they are from many constraints of the secular terrorists of yore. The destruction of the World Trade Centre on September 11 is a stark proof of this horrible truth. Today's terrorist will not be averse to use NBRC agents to cause mass casualties. They seem to prefer to see "more people dead than more people watching".

This article examines the prospects of Nuclear terrorism in South Asia, more particularly in India.

- * Nuclear Terrorism can take the shape of
- * Exploding a nuclear device in inhabited areas.
- * Sabotaging a nuclear reactor and triggering a Chernobyl type disaster.
- * Terrorist attacks including truck bombs and suicide attacks on the nuclear establishments.
- * Use of nuclear material as radiological weapons , by dispersing them by a conventional bomb in crowded habitations

Each of the scenarios above are examined in the following paragraphs.

Exploding a nuclear device in inhabited areas:

Such a scenario would be based on the presumption that the terrorists have access both to the needed nuclear material and the expertise to make it.

The making of a nuclear bomb , though lots of know how is now in public domain, is not all that easy. Apart from the needed fissionable cores , expertise and electronics to make the bomb go from subcritical to critical is a must. The "Fat man" bomb used to destroy Nagasaki in 1945 used 6.2 kg of Plutonium for an yield of around 20 KT. Until 1994 the U.S. Dept. of Energy had estimated that 8Kg of Plutonium would be needed to build a small weapon. It has subsequently been reduced to 4 Kg. The bomb dropped on Hiroshima had 64 Kg of Highly Enriched Uranium (HEU). Subsequently the South Africans are believed to have made bombs with 50 kg of U235 with 93% enrichment. Though Gun assembly used in this bomb is an easier and apparently more reliable

technology , the quantity of fissionable material required is much more and difficult to procure.

It is now generally accepted that either 10 kg of Plutonium 239 or 52 kg of 94% enriched U 235 as metal would be required for critical mass. If oxides are used the weight would be much more. For a crude design however some experts believe that 5 to 6 kg of Pu or 25 kg for HEU (more for a gun type device) would suffice.

Though the last decade saw a number of incidents of nuclear smuggling , most of them were of no consequence from the angle of bomb related material. The more significant ones were recovery of 4 pounds of enriched Uranium by the Georgian Police at Batumi (where a Georgian army captain was involved), six attempted diversions of nuclear submarine fuel-highly enriched uranium-from Northern Fleet storehouses in the Murmansk-Arkhangelsk area , and theft of seven kilograms of highly enriched uranium from the Pacific Fleet at a base at Sovietskaya Gavan in January 1996

The International Atomic Energy Agency provided new figures on Nov 2 showing that the number of confirmed cases of nuclear smuggling had fallen in the rest of the world though it had risen in Turkey, the Caucasus and Central Asia. According to the agency , out of the 150 cases of seizure of radioactive materials in the black market since 1999, only six were related to nuclear weapons grade material.

Most of the experts believe that smugglings and seizures reported were generally by amateurs or sting operations by security agencies.

The actual manufacture of a bomb would require drawings and availability of experts on physical, chemical and metallurgical properties of various materials to be used and other factors affecting the fabrication like neutronic properties , radiation effects both nuclear and biological, high explosive expertise , hydrodynamic knowledge and electrical and electronic expertise. Obviously team work of at least 3 or 4 would be a prerequisite. There are also handling risks like accidental induction of a critical configuration apart from the chemical toxicity and radiological hazards. The design and building would necessitate a secure location for months of experiments. It is thus not within the competence of a fly by night operator to produce a bomb and careful world wide intelligence gathering and cooperation should be able to monitor and locate them.

A more plausible scenario is the stealing or buying of a ready made bomb. There have been reports of Russian Atomic Demolition Munitions (popularly called suit case bombs) missing – as many as 80 – as stated by a senior Russian official , though subsequent reports had claimed that they have all been accounted for. There is also the belief among experts that operating these bombs would require the expertise of a Russian familiar with it.

Sabotaging a nuclear reactor and triggering a Chernobyl type disaster:

This is indeed a very possible and serious scenario. A powerful steam explosion at a power reactor could release enormous quantities of radioactive material in the atmosphere. A small explosive charge can cause unacceptable damage to vital reactor systems and can lead to release of deadly radioactivity or even a melt down. It is strongly believed that there is virtually no protection against sabotage by an insider.

Terrorist attacks including truck bombs and suicide attacks on the nuclear establishments:

Suicide attacks are now a common mode of many terrorist groups. India is painfully aware of this fact. A truck bomb attack against a nuclear establishment can cause enormous damage. Similarly if a suicide bomber gains access to vital points in a nuclear establishment , he could virtually cause mayhem either by attacking control mechanisms and releasing the radioactivity in the atmosphere. Very careful precautions are needed

including strict access control, construction of strong barriers at sufficient distance to sanitise the nuclear stations from truck bomb attacks.

Nuclear Plants could also be attacked in a fashion similar to attack on the World Trade Centre. Considering that a nuclear Plant has potential for release of radioactivity more than a thousand times the radiation from a nuclear detonation, an attack on the plant could lead to a lakh or more deaths and billions of dollars of property damage. The area also, like Chernobyl, could become unusable for decades. The spread of radioactivity could enlarge the area of damage.

Use of nuclear material as radiological weapons:

Highly radioactive agents could be combined with conventional explosives to make a crude, non-fissionable atomic bomb (known as dirty bomb). Non-fissile materials like cesium 137 and cobalt 60 could be hazardous, if they were dispersed by a conventional explosive. Graham Andrew, a technical expert at the International Atomic Energy agency, while dismissing the risk of terrorists building an actual atomic bomb, warned more about the possibility of the creation of a so-called "dirty bomb" - a conventional plastic or TNT explosive salted with some quantity of nuclear isotopes. According to him the spread of radio activity in the metropolitan area due to an explosion of a "dirty bomb" might not be strong enough to cause serious health problems, but could create panic. The material for this could be stolen from low security establishments like hospitals which use radioactive substances. For example, the radioactive isotope cobalt 60 is widely used for radiotherapy in cancer wards, and thus can be found in hospitals all over the world. There are also hundreds of small research reactors at universities and laboratories "that could be a ready source of nuclear materials. In an incident in Brazil in 1987, a 20 gm highly radioactive caesium-137 capsule was stolen from an abandoned radiological clinic by scrap-metal thieves, was cut into pieces, and the thieves handed sections to friends and family members to sell further. As a result, 14 people, four of whom died, suffered radiation burns and another 249 were contaminated. More than 110,000 people had to be monitored for exposure over the following months. A dirty bomb exploded in a major city could produce similar effects. While the death toll may not be high the impact would be great with general panic and demoralization like what is now happening on the anthrax scare.

In South Asia nuclear terrorism cannot entirely be dismissed. Use of dirty bombs should particularly be considered as a distinct possibility. Both India and Pakistan are vulnerable for this kind of attack by Islamic fundamentalist groups especially after support extended to American policy on Afghanistan by the leadership of both the countries.

Pakistan's nuclear programme is well known and documented to be born out of nuclear espionage and smuggling. It is therefore not improbable that some Pakistani official or scientist with sympathies for the fundamentalists would be tempted to supply nuclear technology or material to the latter. The recent arrests of two Pakistani nuclear scientists on suspicion of having been close to the Taliban is worrisome in this regard. The institute for science and international security has warned that since it is not known whether all of Pakistan's nuclear bomb grade material has been converted to nuclear weapons, there is a strong possibility of many kilo grams of bulk fissile material are poorly protected and thus vulnerable to stealing by extremist groups. Another night mare is the possibility of, extremists taking over the Pakistani government, and the control over Pakistan's nuclear explosive materials and weapons being irretrievably lost to these groups.

India is particularly vulnerable to large scale terrorist attacks as Pakistan provides safe haven, and transit, facilities. Pakistani leaders are on record saying that Pakistan will continue to give moral, political, and diplomatic support to several groups engaged in terrorism against India.

Even if Pakistan Govt. refrains from helping any terrorist group from acquiring CBRN capabilities, individuals in the Govt. with access to materials and knowledge on the

subject, motivated by a deadly combination of Islamic fundamentalist ideals and anti Indian emotions, could help such terrorist groups. It is believed that it would take the cooperation of only three or four engineers and a perimeter guard to successfully remove significant quantities of Uranium or weapons-grade plutonium from most secure reactor sites and conceal any evidence of the theft. Another diversion scheme that could be relied on is the evasion of export controls by smuggling highly enriched uranium or plutonium in radioactive cargo that is being legally exported.

The rapidly expanding nuclear programs in India and Pakistan involving massive investments in the construction and operation of civilian nuclear power plants, research reactor, laboratories and reprocessing and enrichment facilities have increased the risk of thefts of nuclear material as well as terrorist attack against the myriad nuclear establishments. Growing stockpiles of nuclear fissionable materials, possibly of actual weapons, would need special technologies, safety systems and security checks and surveillance to protect them. The U.S. Federal Regulations for protection of nuclear material provide that sites at which more than the formula quantity (5 kg of U235 or 2 kg of plutonium is present , should have strong measures to cope with and resist a determined attack by a well trained and well armed group. Such measures need to be thought of in Indian context. Similarly Transport vehicles carrying more than the formula quantity must be accompanied by armed escort teams and have secure communications with their base. Last but not least a robust and well informed intelligence system should be in place to monitor developments in this regard and keep a close eye on all nuclear establishments from security point of view.

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