TERRORISM
AND
COUNTERTERRORISM

Editor
Dr. Vijay Khare

Foreword by.
Prof. (Dr.) Nitin R. Karmalkar
Vice Chancellor, Savitribai Phule Pune University
(formerly University of Pune) Ganeshkhind, Pune-411007, India.

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FOREWORD

Dr. Vijay Khare has, with his book Terrorism and Counter-terrorism, provided an indispensable contribution to Defence and Strategic Studies. This book is a modest effort to analyze and reflect upon the diverse challenges of terrorism faced by the world. It deals with various facets of terrorism and counter-terrorism, which are debatable between researchers, academicians and policy makers. It not only contributes to the concept of emerging challenges of terrorism policy makers but also of terrorism and its social, economical, political and physiological impact on human being. This volume vividly covers diverse aspects of terrorism and internal security issues such as military power, counter-terrorism and mechanism, radicalization and violent extremism, insurgency, low intensity conflicts and internal security issues. It enriches students, researchers and policy makers with abundant empirical evidence to bring forth the significance of various challenges and possible responses.

Dr. Khare asserted that contemporary terrorism is hologrammatic: it thrives on fear emanated through violence and propagated by using communication technology. It has tweaked the traditional concept of security and shifted the entire debate to a non-traditional security domain. In order to launch effective counter-terrorism measures, it requires strategic centre focused on human security and national interest. In most of the counter-terrorism strategies, the role of law enforcement agency and domestic intelligence has drastically increased.

I would like to congratulate Dr. Vijay Khare, Professor and Head, Department of Defence and Strategic Studies (DDSS), Yashwantrao Chavan National Centre of International Security and Defence Analysis (YC-NISDA) and Strategic Culture and Security Foundation for an impeccable piece of work and wish them all the very best for their endeavours ahead and hope that DDSS, YC-NISDA will bring more laurels to Savitribai Phule Pune University.

Prof. (Dr.) Nitin R. Karmalkar
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Nuclear Terrorism: Investigating the Threat and Exploring Possible Scenarios

Arun Vishwanathan

Introduction

Over the past couple of decades, we have been witness to terrorist groups increasingly adopting innovative methods and techniques. Innovation has been seen in the methods they employ for carrying out attacks, like use of drive by shootings, vehicle or human improvised explosive devices (IEDs), simultaneous attacks on multiple locations in urban spaces. While the use of such techniques has caused significant loss of life, injuries, damage to property, the use of such methods has also introduced an element of surprise, thereby making it difficult for the security forces to prepare for any such eventuality.

The second and equally worrisome trend has been greater use of technology by terrorist groups to recruit, train, plan and carry out terror attacks. The use of internet-based technologies, like social media, i.e. Twitter, Telegram, internet-based chat rooms, propaganda websites give the terrorist groups wider access to a larger pool of recruits cutting across national boundaries. In the 2008 Mumbai terror attacks by the Pak-based terrorist group Lashkar-e-Toiba (LeT), we witnessed, inter alia, use of GPS devices to navigate to the landing locations by sea and pinpoint attack locations in the city. LeT has also employed Voice over Internet Protocol (VoIP) telephones to communications between the terrorist and their Pakistan-based handlers.

In addition to greater use of technology and innovativeness to carry out attacks by terrorist groups; we have also seen continuing efforts by terror groups, like the Al Qaeda, to acquire Weapons of Mass Destruction (WMD) that includes Nuclear, Biological and Chemical weapons. Rolf Mowatt-Larsen has put together a chronology of Al Qaeda’s efforts to acquire WMD, wherein the group has been making consistent efforts since 1993 to get access to uranium. The first of many such efforts was based in Sudan where the group attempted to acquire Uranium for a sum of US$1.5 million with the involvement of former Sudanese President, Saleh Mobruk. These efforts, Rolf Mowatt-Larsen claims, assumed greater “systematic, programmatic efforts” in 1998 after the merger of Ayman al Zawahiri’s Egyptian Islamic Jihad with the Al Qaeda.

Given the fact that acquiring WMD and in particular nuclear weapons is an avowed goal of a major terrorist group like the Al Qaeda, it becomes important to pay due attention to ensuring security of fissile material and safety of nuclear power plants and other associated facilities. In order to perform this task efficiently and effectively, it is important to be able to distinguish between hyped and real threats. This is where the nomenclature of “nuclear terrorism” itself becomes a hindrance. With the word nuclear attached to terrorism, every incident whether real, misreported or just pure rumour mongering becomes a priority thereby taking away precious time and resources away from attending to the real threats.

In 1995, the International Atomic Energy Agency (IAEA) put in place the IAEA Incident and Trafficking Database (ITDB) system. The system was strengthened after the September 2001 attacks. The 2016 factsheet put out by the ITDB mentions that 131 states participated in the ITDB programme. The ITDB 2016 Factsheet states that there have been a total of 21 attempts to smuggle and sell weapons-usable fissile material between 1995 and 2015. Of these, 13 were confirmed incidents of unauthorised possession of highly enriched uranium, 3 incidents of unauthorised possession of plutonium and 5 cases of plutonium beryllium neutron being seized in unauthorised possession. Further, the report states that some of these incidents involved smuggling of the material across international borders for illegal sale. As Table 1 below highlights, IAEA statistics themselves establish the fact that in many cases, kilogram quantities of the weapons-usable nuclear material have been seized from black marketers and smugglers.
Table 1: Incidents of unauthorised possession of >1 kg of HEU/Pu (1993-2004)\(^8\)

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Material Involved</th>
<th>Incident Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 1994</td>
<td>St. Petersburg, Russian</td>
<td>HEU 2.972 kg</td>
<td>An individual was arrested in possession of HEU, which he had previously stolen from a nuclear facility. The material was intended for illegal sale.</td>
</tr>
<tr>
<td>December 1994</td>
<td>Prague, Czech Republic</td>
<td>HEU 2.73 kg</td>
<td>HEU was seized by police in Prague. The material was intended for illegal sale.</td>
</tr>
<tr>
<td>June 1995</td>
<td>Moscow, Russian Federation</td>
<td>HEU 1.7 kg</td>
<td>An individual was arrested in possession of HEU, which he had previously stolen from a nuclear facility. The material was intended for illegal sale.</td>
</tr>
</tbody>
</table>

What Makes the Risk of Nuclear Terrorism Real?

As the preceding paragraphs clearly establish the fact that terrorist groups like the Al Qaeda have the intent and motivation to use WMDs including nuclear weapons. Terror groups have increasingly made greater use of technology and have shown a heightened level of technical awareness. Given the above, it is not beyond the realm of the probable, that in case they are able to secure access to sizeable quantities of weapon-usable fissile material they could use it to carry out acts of nuclear terrorism.

The risk of terrorist groups getting access to fissile material has been increasing in recent years due to three reasons. First, is the continued existence of large stockpiles of weapons-usable fissile material across the globe. Secondly, the expansion of civilian nuclear power programs and increasing number of nuclear power plants and associated facilities across the globe. The third reason that heightens the risk is the fact that terrorism and violent extremism has itself been growing across the globe.\(^9\)

Expanding Nuclear Stockpiles

The 2015 Global Fissile Material Report released by the International Panel on Fissile Material (IPFM) has estimated the civilian and military stockpile of highly enriched uranium and plutonium fissile material across the globe.

Highly Enriched Uranium (HEU): All the Nuclear Weapon States as defined in the NPT, namely, China, France, Russian Federation, United Kingdom and United States have ceased production of HEU for weapons purposes. They, however, continue to produce HEU for fuelling their naval, submarine reactors. The IPFM 2015 report estimates that HEU stocks globally are 1370 ± 125 tons.\(^8\) Assuming about 25kgs of HEU for simple first generation fission-based nuclear weapon, the stockpile will be enough for over 54,000 nuclear weapons.

Plutonium: The 2015 IPFM report estimates that the global stockpile of separated Plutonium (Pu) is about 505 ± 10 tons of which about 234 tons was Pu for weapons use and 271 tons produced for civilian use. Assuming about 3kgs of weapons-grade plutonium/weapon, 234 tons of Pu fissile material translates into 70,760 weapons amount worth of material. Similarly, assuming that 5kg of reactor-grade Pu can be used to make a nuclear weapon, 271 tons Pu for civilian use can be used to manufacture 49,169 nuclear weapons.

The point in providing the above statistics is to share the amount of fissile material that has been accumulated by the nuclear-armed states, in particular the United States and the Russian Federation. Nuclear security, given the nature of the material, and the secretiveness of the institutions involved are inherently complex affairs. Ensuring foolproof security for such a large mass of fissile material across the globe is a time and resource consuming affair.

Expanding Nuclear Power Plants and Facilities

While nuclear power has been on the decline in the Western countries, since 2001, nuclear energy has witnessed a renaissance of sorts in Eastern Europe and Asia. A new spate of expansion of nuclear energy has been witnessed in these regions driven by increasing domestic energy demands, attempts to mitigate climate change concerns, address energy security concerns like disruption or rise in prices of conventional sources of energy like oil and gas.

The International Atomic Energy Agency’s Power Reactor Information System (PRIS) states that currently there are 449 reactors under operation and 60 reactors under construction. An analysis of the statistics available in the PRIS highlights the fact that on an average 8 reactors started construction between the years 2008-16.\(^1\) China with 20 reactors under construction far outstrips Russia and India; the next two countries in the list have 7 and 5 reactors that are currently under construction. See Figure 1 for a detailed breakup of the reactors currently under construction.
Current Approach to Nuclear Security

More often than not, the West has been prone to lecturing the rest of the world about nuclear security issues. Such an approach stems out of the false perception that nuclear weapons, material and facilities are safer in the West. The fact of the matter is that nuclear weapons are dangerous weapons and securing them, wherever that might be, is a complex affair. Take the example of what transpired on July 28, 2012, at the US’s Y-12 weapons-grade uranium storage facility at Oak Ridge, Tennessee. The facility is a Category-1 facility where a large part of American weapon-grade highly enriched uranium (HEU) is stored in the HEU Materials Facility which stores about 449 tons of Highly enriched Uranium. 

Three unarmed senior citizens, which included an eight-two year old nun who were part of the Ploughshares movement and were protesting against nuclear weapons, managed to cut across four perimeter fences and were able to roam around freely in the facility for almost 90 minutes without being challenged within the Protected Area which is at the heart and is the most heavily guarded portion of the Y-12 facility. The reason behind why the trio was able to successfully circumvent many of the perimeter security alarms on the perimeter and reach the main building is a complex one. However, here it will suffice to say that the facility building was guarded by sensors and alarms which were prone to giving many false alarms. The guards at the facility had thus stopped answering the alarms and as a result failed to respond to the three Ploughshares activists breaking into the facility.

The fact of the matter is that the above act of breaking into the Y-12 facility is not an isolated incident. Ploughshare activists have carried out similar actions across the United States. In the past, they have managed to get unauthorised access to the Kitsap Naval Base, which is the home port for more than half of America’s Trident ballistic-missile submarines; the Andrews Air Force Base which stations the B-52 bombers; a Minuteman missile complex in eastern Colorado among other sites. 

The scary part of the above actions is the fact that it is possible for dedicated Ploughshares activists—with access only to public documents and maps and a year of planning—to break into the heavily guarded Y-12 facility with such ease. Terror groups, who are equally if not more motivated with access to the same information and with insider assistance could do better.

The above discussion points to need for world leaders to understand that there should be another way the issue should be approached. As Charles Perrow writes in the Bulletin of Atomic Scientists, “Our current approach to risk is ‘probabilistic’ ... but we should also consider a worst case approach to risk, the ‘possibilistic’ approach.” Simply put, currently countries are always preparing on the basis of the last attack but are generally ill-prepared for the attack that has never happened before.

P.R. Chari writing for the Carnegie Endowment for International Peace highlights the issue of transparency which often comes up in many articles dealing with the issue of nuclear security. Transparency is somehow seen as a panacea for all problems dealing with nuclear security, as if countries were to be more transparent all their issues surrounding nuclear security would be solved. The reverse has also been argued in the case of India. Just because of a lack of transparency, it has been stated that all is not well in India among other countries. Though increased transparency and better communication would help in building trust and is important during crises, it is important to realise that given the catastrophic nature of events in case of a successful attack, governments cannot be completely transparent or free in sharing their plans beyond a point.

Thus, the problem we face is a complex one. On one hand, we are witness to the rise of terrorism as seen by the rise of the Islamic State in West Asia. Closer home, we are seeing regular terror attacks by Sunni terror groups in Pakistan. Also, these groups are becoming much more lethal and innovative and equally adept at using technology for recruitment, training and carrying out terror attacks. This problem gets compounded by the twin fact that large
amounts of fissile material enough for making thousands of nuclear weapons is stored in isolated facilities located across the globe. For historical, economic and for pure logistical reasons, it is hardly possible to guard all these facilities and missile and weapon storage sites against all current and future attacks.

Nuclear Terrorism: Possible Scenarios
In order to prepare for as many eventualities as possible, it is necessary to outline the possible scenarios in which an act of nuclear terrorism could take place.

Explosion of a Nuclear Device: The worst possible situation would be the actual explosion of a nuclear device. This could take place if the terrorist is able to get access to fissile material and put together a working nuclear device. The other scenario could be detonation of a nuclear device in storage. In both these situations, the damage potential as well as the difficulty potential is “High” due to the lack of easy access to weapons storage or fissile material storage facilities. Insider assistance remains crucial whether to get access or in form of technical assistance to put together fissile material into a working nuclear weapon.

Sabotage of a Nuclear Power Reactor: The second possible scenario could be the sabotage of a nuclear power reactor or any other operational nuclear facility like a uranium enrichment facility or nuclear reprocessing plant. The aim of the terrorist in such an attack would be to override the existing safety controls in the facility and ensure atmospheric release of radioactivity. The damage potential and the difficulty of a successful operation is High. This is primarily because of the necessity of possessing technical expertise to override the safety features in place in such a facility, which would prevent radioactive release. Again, inside access and technical assistance would be crucial for the success of the endeavour. Given the fact that a nuclear power plant contains tons of nuclear fissile material, the damage potential in case of success of a terrorist attack would also be exponentially higher. As compared to the 64 kg of HEU in Little Boy, the bomb dropped on Hiroshima, the amount of fissile material in the Fukushima reactors at the time of the accident was 1852 tons. In terms of radioactivity released, the Little Boy released 89 Tera Becquerel of Cs-137 as compared to 15,000 terabecquerels of Cs-137 released following the Fukushima accident.\(^19\)

Terrorist Attack on a Nuclear Storage Facility: The main aim of such an attack would be to get access to fissile material or detonating the facility with an aim of dispersing radioactivity/fissile material. As seen from the various successful attempts by Ploughshares activists, a lot of information about the location and the facilities is available in the public and more details could be gathered with minimal surveillance. Also, the complex nature of security and routine nature of the duties at these facilities causes fatigue amongst the employees which leads to laxity in implementing security controls as they are seen as cumbersome and time consuming. While insider assistance would be useful, it is not critical in planning and carrying out such an attack.

In the recent past, we have seen terrorist attacks taking place close to locations where nuclear missile storage facilities are stored in Pakistan. Shaun Gregory writing in the American West Point, Counter Terrorism Center Journal CTC Sentinel\(^20\) highlights three such incidents:

- November 1, 2007—Attack on the nuclear missile storage facility at Sargodha
- December 10, 2007—Attack on Pakistan's nuclear airbase at Kamra by a suicide bomber
- August 21, 2008—Attack by Pakistani Taliban suicide bombers where several entry points to one of the armament complexes at the Wah cantonment were blown up. Wah cantonment centres are considered to be one of the facilities where Pakistan’s main nuclear weapons are assembled.

Radiological Dispersal Device (RDD): RDD is essentially dispersal of radioactive material by detonating it with a high explosive. It is not very difficult for a terrorist group to carry out such an attack. Many radioactive isotopes are used in hospitals and laboratories. It is therefore quite easy for any such group to get access to these materials. However, an RDD is not a nuclear weapon as it would not create a chain reaction. The physical damage would be limited to injuries or deaths from the blast. However, a lot of panic would be created and the RDD would have to be followed up with an expensive clean-up operation which would hurt the economy and the public sentiment at large.
### Table 2: Possible Types of Nuclear Terrorism Attacks and their Damage Potential and Difficulty Factor

<table>
<thead>
<tr>
<th>Type of Nuclear Terrorism</th>
<th>Damage Potential</th>
<th>Difficulty Factor</th>
<th>Reasons for difficulty</th>
<th>Dangers to be guarded against</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuclear Device Exploded</td>
<td>High</td>
<td>High</td>
<td>- Difficulty to get access to Fissile Material/Weapon&lt;br&gt;- Lack of Technical Expertise to put together the fissile material into a working nuclear weapon&lt;br&gt;- Difficulty to override the PAs or other similar controls to prevent unauthorised use of nuclear devices.</td>
<td>- Nuclear Security at nuclear installations, missile storage and weapons storage sites need to be upgraded.&lt;br&gt;- Insider Assistance very important.</td>
</tr>
<tr>
<td>Sabotaging a Nuclear Power Reactor</td>
<td>High</td>
<td>High</td>
<td>- Lack of Technical Expertise to cause a critical disruption by overruling safety checks which leads to release of radioactivity</td>
<td>- Gaining Access to the control room which is highly guarded.&lt;br&gt;- Cyber Attacks&lt;br&gt;- Insider Assistance very important</td>
</tr>
<tr>
<td>Terrorist Attack on a Nuclear Storage Facility with an aim to get access to fissile material or detonating the facility with an aim of dispersing radioactivity/fissile material</td>
<td>Medium to Low</td>
<td>Medium</td>
<td>- Difficulty to get access to the facility where the fissile material is stored.</td>
<td>- Given access to public information and maps, motivated groups have been able to get unauthorised access to these facilities.&lt;br&gt;- Complex nature of security and routine nature of the duties causes fatigue amongst the employees.&lt;br&gt;- Insider Assistance Useful</td>
</tr>
<tr>
<td>Radiological Dispersal Device (RDD)</td>
<td>Low</td>
<td>Low</td>
<td>- It is fairly easy to procure fissile material from hospital and laboratories. Dispersal of radioactive material by detonation with high explosive not very difficult for a terrorist group, would not create a chain reaction, physical damage limited to explosive blast damage.</td>
<td>- Controls, proper material accountability and disposal of fissile material at hospital, laboratories.</td>
</tr>
</tbody>
</table>

## Conclusion

As terrorist groups continue to adopt innovative means of carrying out attacks and make growing use of technology in such attacks, it becomes imperative to employ a "systems-approach" to security to prevent nuclear material and technology from landing in the hands of terror groups. As Charles Perrow argues that in complex systems like nuclear facilities, security must be more reliable and tightly regulated. Focusing on the people providing physical security to these facilities, it is important to be cognizant of the fact that many a time, it is a situation where very bright people are engaged in very boring jobs. This is a recipe for disaster as brought out in the Y-12 National Security Complex at Oak Ridge, Tennessee, and more recently in the case of cheating by US missile officers in their proficiency tests. Thus it is important to ensure that the first responders or the personnel guarding these facilities are constantly motivated, their training is upgraded and morale is high.

Given the existence of large amounts of fissile material across the globe, several successful cases of unauthorised access by activist groups to weapons and fissile material storage facilities and the stated intent of terror groups like the Al Qaeda, the absence of a nuclear terrorism incident is quite puzzling. We can ascribe it to either pure luck or successful thwarting of such attempts by security and police forces. However, nuclear terrorism is a danger that is very real and which we must collectively guard against.

### NOTES

1. Arun Vishwanathan is Associate Professor, Centre for Security Studies, School of National Security Studies, Central University of Gujarat, INDIA. An earlier version of this paper was published in *International Journal for Social Science Research and Global Security*, Vol. 1 (1), January-March 2018. The author can be reached at arun_summerhill@yahoo.com
Military Diplomacy: Analysis of the Chinese Model and Lessons for India

Brig. Madhusudan R. Mutarkar

"There is a theory that China will tend to push, and if you bend, they will push some more."

—Benigno Aquino III Outgoing President of Philippines, Time 06 Jun 2016

Introduction

In the realm of national strategic considerations, one finds that military and diplomatic affairs merge in an intertwining relationship. At this point, it must be recognised that diplomacy and military force are inseparable instruments of national policy. Except in those international agreements, which contain automatic sanctions, the only guarantee by which a treaty may be kept in force is the actual or implied threat of retaliatory action. The threat of the force of arms is the ultimate sanction, which supports any diplomatic action. Diplomacy, which depends upon only political or economic sanctions, rests upon a precarious base; diplomacy unsupported by a force in being has the appearance of a bluff. Chamberlain's attempts at appeasement of Hitler failed miserably in the Second World War, since it lacked the required force. For this reason, the military capability to exert the force of arms in the appropriate place is essential in support of successful diplomacy. Conversely, diplomatic action can contribute importantly to the achievement of military capability.