

Managing the dirty bomb threat

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Key Points in this Paper

- The perceived threat of a dirty bomb attack in the US or the UK has increased in recent years.
- Many experts believe that the immediate casualties and blast damage caused by such an attack would be little more than that of a conventional explosion.
- Despite this a dirty bomb remains an attractive option to terrorists because of its potential psychologically and financially disruptive impact on a city.
- UK and US Government plans relating specifically to the provision of public information and response plans in the event of a dirty bomb attack are vague and inadequate, and risk adding to an already difficult situation.
- At national and international level various initiatives have been embarked upon in order to reduce the illegal trafficking of radioactive materials.
- For these initiatives to fully succeed, they must receive sustained financial and political support, both from national governments and international organisations. They must also be backed up by effective cooperation within the international security community.

Introduction

On 19 January 2005, the FBI issued a warning that a group of Chinese and Iraqi nationals were involved in a plot to launch a dirty bomb attack in Boston. The Washington Post reported that:

An anonymous tip about a 'dirty bomb' threat sent this city [Boston] into a tizzy Wednesday evening, with nerves already frayed by a rush-hour snowstorm and speculation that an attack might be timed to coincide with the eve of the presidential inauguration in Washington.

Pictures of the suspects were splashed across TV screens and the Governor of Massachusetts abandoned his visit to Washington in an effort to allay public fears. However, the threat turned out to be a hoax: one immigrant-smuggling gang was trying to reap revenge by implicating another gang. No links to terrorist groups or radioactive materials were established. The Post went on to ask, "Had the frenzied response fuelled a panic that officials said they were trying to avoid?"[1]

The prospect of the use of dirty bombs, or radiological dispersion devices (RDDs), as a weapon by terrorists has been the source of significant media coverage in recent years.[2] It has been addressed in most areas of the print media as well as being the subject of a number of television documentaries, on both sides of the Atlantic. Most recently, in September 2004 the BBC screened a documentary entitled 'Dirty War', which dramatised the effects of a dirty bomb attack in London.[3] However, despite the level of media coverage, public perceptions of the true dangers of dirty bombs remain, to a large extent, inaccurate and distorted.

What are dirty bombs?

Dirty bombs consist of a conventional explosive device placed with radioactive material. The intention is that the detonation of the bomb will spread radioactivity over a wide area causing death, sickness and panic through the explosion itself and subsequent radiation poisoning, making the affected area uninhabitable.

Explosives are not essential for all radioactive Dispersal Devices (RDDs). For example, the scattering of radioactive dust in the wind might have the same contaminating effect as spreading the same material with explosives. Even the placing of a powerful radiological source in a public place could have the potential to give significant doses of radiation to those nearby.[4] Dirty bombs are not generally classed as weapons of mass destruction (WMD), as their prime potential impact is in contaminating buildings rather than immediate

destruction.

Practicality and effectiveness

In July 2002, the Australasian Radiation Protection Society issued a press release concerning the potential impact of a dirty bomb attack. One of its key paragraphs stated that:

Several media portrayals, including some in popular science magazines which purport to give accurate information, are seriously lacking in balance inasmuch as they fail to point out the demonstrably low level of immediate health risk, apart from the direct effects of the blast, which such an attack would present.[5]

The statement was released a month after the arrest of Jose Padilla, a US citizen with known ties to Al Qaeda, on suspicion of planning to detonate a dirty bomb in a US city.[6] Whether this accusation was exaggerated or not, the incident significantly raised the profile of the threat of radiological weapons in the public domain. However, little attention was given to the potential effectiveness of such weapons.

Obviously, the main requirement for a person wishing to construct a dirty bomb is a radioactive source. The condition of the former Soviet Union's stockpile of radioactive materials causes much concern internationally about the possibility of some of this material falling into the hands of terrorists.

However, it might be much easier, safer and cheaper for terrorists to try and obtain radioactive materials in or near to the country they wish to attack. Radioactive materials are commonly used for civilian purposes, in medicine, engineering and food treatment.[7] Most of these sources are not particularly powerful, but some, such as Iridium 192, Caesium 137 and Cobalt 60, are highly radioactive and are commonly transported around the UK.[8] It was an opened canister of Caesium 137, looted from an abandoned cancer treatment centre, that contaminated 200 people in the town of Goiaina, Brazil, in 1987. Four people died, and 85 homes were levelled in order to decontaminate the affected area.[9]

The security of radioactive materials and nuclear facilities in the UK has been heavily questioned in recent years. In October 2003 the BBC TV programme 'Kenyon Confronts' investigated the security of radioactive materials in transit in Britain. Posing as businessmen, the BBC reporters contacted businesses that specialised in the transport of radioactive materials. They were able to obtain, without much difficulty, information concerning the travel routes and delivery times of these materials. They also followed a number of the delivery vehicles around the country, and found security to be extremely weak.[10] The Home Office responded to the broadcast by publishing on its website a Q&A document in order to reassure the public.[11]

Further, in February 2005 the Office for Civil Nuclear Safety made public a report criticising the security of nuclear power stations in the UK. The report found that 40 security breaches had occurred at plants around the country in the 12 months leading up to April 2004. Eight of these were described as "failures of security leading to unacceptable or undesirable consequences".[12]

The immediate contamination risk from a radiological bomb, even a powerful one, is likely to be localised, affecting a relatively small number of people. Although radioactive dust from such a device could be spread over a wide area, depending on weather conditions, the doses absorbed by victims in the short period of immediate exposure would not be much greater than those received by patients during CT scans or nuclear medicine procedures.[13] However, there are numerous variables to be considered when trying to predict the effects of such an attack: the power of the radioactive source, the method of dispersal used, weather conditions and the length of exposure to the radiation.

Even the use of a substantially more powerful radiological source might not be

immediately hazardous to people in the affected area. Furthermore, the people most at risk would be the terrorists themselves, as they assembled and transported the device, while the material was in a concentrated form.[14] For example, in September 1999 six men attempted to steal a container of radioactive Cobalt (probably Cobalt 60) from the Radon Special Combine chemical factory in Grozny, Chechnya. Three of the suspects died of radiation poisoning while the other three had to be admitted to hospital.[15]

Who might use a dirty bomb and why?

The radiological impact of a dirty bomb is uncertain. In 1987 the Iraqi army tested a large radiological bomb for possible use in the Iran-Iraq war, but abandoned the plan because the radiation levels produced were not considered high enough.[16] Dirty bombs do however have two advantages that might make them attractive to terrorists. First, given the general public's inherent distrust of all things nuclear, widespread panic and chaos could be a major problem if there was even a hint that radiological materials were involved. Second, the cost of the cleanup operation, and the economic implications of having large parts of a city centre rendered unusable, are likely to be severe.

Numerous terrorist groups have been linked to dirty bombs, with Islamic terrorists generally judged to constitute the main risk. Public attention in the West has tended to focus on the perceived threat of a dirty bomb attack by Al Qaeda groups. However, it is Chechen rebels who have the most significant track record to date. In November 1995, for example, they buried a container of caesium in a Moscow park, boasting to a Russian television station of their ability to construct such devices. And in December 1998 in the town of Argun, Chechnya, Russian-backed authorities announced that they had discovered and defused a landmine attached to a container of unidentified radioactive material near a railway line outside the city.[17]

UK response plans

The provision of emergency public information has long been a tricky issue for governments. In relation to nuclear and radiological issues the problem is particularly acute. The 1945 Hiroshima and Nagasaki bombs, the Cold War nuclear standoff and the Chernobyl disaster mean that the general public is well informed about the risks of nuclear explosions and high-level radiation. As a result, UK government attempts to calm the public have often been met with derision and mockery.

In Britain, in 1963, in response to the possibility of a nuclear attack on the country, the government issued a booklet entitled 'Advising the Householder on Protection Against Nuclear Attack'. Much of the advice may seem naïve to readers today, such as whitewashing windows and wearing "stout shoes", but it was designed to persuade the public that a nuclear attack was something that would not inconvenience daily life for long.[18] In 1976 the British Government released a bleaker booklet, 'Protect and Survive', which included information on how householders should deal with dead bodies in their homes.[19]

The British public's reaction today to a perceived dirty bomb attack is very difficult to predict. If people heard on TV or radio that a terrorist attack had resulted in the dispersal of radioactive material, many would probably think that a nuclear explosion had occurred. This would not be surprising, given that the popular media often refers to dirty bombs as a type of WMD or the 'poor man's nuclear weapon'.

As regards official planning for such an attack, government advice differs little from that given out in relation to other emergencies. In general, people are advised to remain where they are, most likely their place of work, and wait to be informed by the authorities. The Home Office tells people: "If you think you may be affected, GO IN, STAY IN and TUNE

IN. The authorities will use local radio and TV to deliver information and advice".[20]

Similarly, MI5 advice to the public includes the following:

Remember that evacuation may not be the best solution. You will need to be guided by the emergency services on the day. Identify shelter areas in case you are advised not to leave the building...in the event of an attack, any obvious victims should be told - by phone if necessary - to remain in the part of the building they are in.[21]

However, recent US research suggests that the public may not respond in the way predicted by the authorities. In September 2004, the US Centre for the Advancement of Collaborative Strategies in Health published a report entitled 'Redefining Readiness: Planning through the eyes of the public'.[22] It points out that current emergency plans do not take into account all the risks that people would face during a dirty bomb attack, and so would put them in difficult decision making positions. In particular, the specific advice to remain inside a building during an emergency is likely to go unheeded, since the natural inclination of most people would probably be to get as far away as possible from a contaminated area.

Furthermore, as the attack would probably occur during the day, most adults would be at work while their children were at school. The report states that most adults know little or nothing about the emergency arrangements at their children's schools. Therefore, there is a high probability that substantial numbers of people would ignore the authorities and try to get to their families, possibly adding to an already chaotic situation. The report also points out that the emergency procedures of work or public buildings that people are likely to be in during a terrorist attack concentrate on prevention and evacuation, and not as acting as safe havens should the need arise.[23]

Current UK advice to the public

Last summer the Home Office sent a copy of its emergency planning booklet, 'Preparing for emergencies: What you need to know',[24] to every home in Britain. As well as general advice on how to deal with a range of emergency situations, the booklet also contains a page specifically relating to chemical, biological and radiological incidents as a group. No differentiation is made between the three. If affected by such an attack, the public are told:

- to move away from the immediate source of danger;
 - to wait for the emergency services to arrive and examine them and, if necessary, decontaminate them; and
 - if they go home untreated they could contaminate others and make any incident worse.
- [25]

This advice is somewhat problematic in relation to dirty bombs, since the general public could not tell immediately whether or not a terrorist explosion had dispersed radioactive material. In fact, there may be no explosion involved in such an attack. In the case of an explosion, many people would immediately leave the scene, while others would make their way towards it, in the hope of assisting survivors. There are many variables that would affect the length of time it would take the emergency services to arrive on the scene, identify the attack as radiological, identify the contaminated area and issue instructions to the public. According to the Home Office advice noted above, people would most likely be asked to leave the 'immediate source of danger' - the contaminated area - but to also wait around for the emergency services to examine them. Finding an effective balance between these two pieces of advice might prove problematic in an emergency situation.

This leads on to a point of great importance, that of the level of public cooperation in such an incident. How would the public respond to such an unprecedented situation? Would they wait around patiently in an area that they believe may or may not be contaminated while the emergency services mobilised a response? Here the issue of

school emergency planning arises. In the event of a radiological attack, worried parents will want to know that their children are in safe hands. In relation to schools, 'The Preparing for Emergencies Booklet', says:

All schools have plans to cope with local emergencies such as fire and flood, and teachers and support staff do all they can to look after the pupils in their charge. You can find out more about school emergency planning from www.teachernet.gov.uk/emergencies.

This website does not detail school emergency procedures, but offers advice to schools on how to create emergency plans. It contains a page dealing with terrorist incidents, which again gives no information on school emergency plans, but instead provides links back to the Home Office, where a concerned parent may well have started their search for information.

Preventive measures

The control of the spread of radioactive material is seen as an important step towards reducing the threat of a dirty bomb being used. At national and international levels a number of initiatives have been launched with this goal in mind.

UK measures

The Foreign and Commonwealth Office (FCO) plays a leading role in coordinating the UK's participation in international initiatives under which the dirty bomb threat can be tackled. These are collaborative, multilateral efforts and take their lead from UNSC Resolution 1540 (see below) and other UN resolutions. Foremost among them are international frameworks such as the Proliferation Security Initiative and Cooperative Threat Reduction.[26] The FCO also sponsors the Counter Terrorism Programme, which operates under the auspices of the Global Opportunities Fund. The programme aims to forestall terrorist attacks in the UK by directing pre-emptive security efforts, including the training of local security forces, towards 'target countries [which] have been identified according to the current threat posed to UK interests from terrorism'.[27]

Collaborative measures taken by MI5 include the monitoring of groups and individuals of 'proliferation concern' who might seek to obtain sensitive materials, technology and information in the UK. This involves liaising with public, private and academic institutions, as well as other international organisations. Special attention is paid to the transfer of sensitive technological information, which MI5 refers to as 'Intangible Technology Transfer'.[28]

Regarding the transport of sensitive materials in the UK, the Radioactive Material (Road Transport) Regulations 2002 is an updated and wide-ranging piece of legislation that closely follows IAEA guidelines. It contains 14 provisions concerning the transport in Great Britain of radioactive material and details transport limits, packaging requirements, labelling etc.[29]

EU measures

In the EU, a number of initiatives, incorporating both preventive and responsive elements, have been launched in recent years to deal with the dirty bomb threat. In October 2001 the Ghent European Council asked the European Council and Commission to organise a programme to improve security cooperation among member states in relation to CBRN threats. The first measure taken was the strengthening of the Community Action Programme for Civil Protection. This was quickly followed by the 'Community mechanism to facilitate reinforced cooperation in civil protection assistance interventions'. Its main provisions provide for enhanced interstate cooperation and the identification of various relevant resources, the setting up of training programmes and the maintenance of up to

date information systems.[30]

In December 2002 the Council and the Commission adopted the 'Programme to improve cooperation in the European Union for preventing and limiting the consequences of chemical, biological, radiological or nuclear terrorist threats', more commonly known as the 2002 CBRN programme. As well as reviewing existing measures, the programme also set out a list of objectives, along with creating an annual review process to help ensure that real progress is made. The objectives include:

- improved risk analysis;
- reduction of public vulnerability;
- increased speed of detection of a CBRN attack;;
- mitigation of the consequences of a CBRN attack;
- strengthening of scientific expertise;
- increased cooperation with third countries; and
- ensuring efficient coordination of the various instruments involved in the implementation of the programme.[31]

US measures and Homeland Security

Since the terrorist attacks of 2001, over a dozen pieces of legislation that in some way deal with the dirty bomb threat have been put before the Senate and the House of Representatives. Some, such as Hilary Clinton's 'Dirty Bomb Prevention Act of 2003' and Edward Markey's 'Dirty Bomb Prevention Act', deal quite specifically with the threat. However, despite the apparent increased threat of a radiological attack, the overwhelming majority of these bills remain under review by various committees.[32]

Also since 9/11 the US Congress has approved massive funding to fight international terrorism, increase homeland security and build a new missile defence system. However, funding increases for securing nuclear materials have not matched the spending increases in these areas.[33] Having been cut in all departments for the 2005 fiscal year, funding for threat reduction programmes in the 2006 budget has increased in two departments. Resources allocated to the Energy Department have gone up from \$439m to \$529m, and in the Defence Department from \$409m to \$416m. The State Department's threat reduction budget of \$71m remains unchanged, which means a slight decrease in funding when inflation is taken into account.[34]

In February 2005, the Bush administration announced that a further \$200m funding was to be directed into US efforts to monitor the security and movements of radioactive materials into and around the country. The recently established Office for Domestic Nuclear Detection (ODND) coordinates these activities. The ODND is part of the Department of Homeland Security and includes representatives from the Department of Defence, the State Department, the Department of Energy and the FBI.[35]

Nunn-Lugar Cooperative Threat Reduction Programme

In 1991 the US and Russia began an initiative, the Nunn-Lugar Cooperative Threat Reduction program, which aimed to manage the threat posed by Russia's aging nuclear stockpile. Since 1991 the US Congress has allocated around \$8 billion to Nunn-Lugar and other nuclear threat reduction programs in Russia and former Soviet states.[36]

National Strategy to Combat WMD

In September 2002 President Bush issued National Security Presidential Directive 17, which led four months later to the issuing of the National Strategy to Combat Weapons of Mass Destruction. According to this strategy, the US approach to dealing with the spread of nuclear materials rests on three pillars: counter-proliferation, non-proliferation and WMD consequence management.[37]

International measures

UNSC Resolution 1540

In September 2003, President Bush called on the UN to adopt a resolution aimed at preventing sensitive materials falling into terrorist hands.[38] The UN Security Council responded in April 2004 by passing resolution 1540, aimed at keeping CBRN materials out of the possession of terrorists and black marketeers. It requires all member states to:

- adopt laws to prevent 'non-state actors' from manufacturing, acquiring or transporting CBRN materials and possible delivery systems;
- secure and account for all such material and to increase border security to prevent trafficking of such materials; and
- cooperate in strengthening safeguards over nuclear materials.

The resolution was adopted under chapter VII of the UN Charter, which allows military enforcement if necessary.[39]

G8 Global Partnership

The US launched an initiative through the G8 in order to raise more funds for non-proliferation programmes. In June 2002 the G8 nations met in Canada and agreed upon a plan entitled the 'Global Partnership Against the Spread of Weapons and Materials of Mass Destruction', also known as '10 plus 10 over 10'.[40] Under this plan the US is committed to spending \$10 billion dollars over ten years on non-proliferation schemes with the other G8 nations contributing a further \$10 billion over the same period. As regards UK participation, in June 2002 Tony Blair pledged £750m to the Global Partnership over the ten years. In July 2003 Jack Straw and Igor Ivanov signed a deal which saw the immediate transfer of £30m to these initiatives.[41]

As well as the provision of funding for non-proliferation initiatives, the agreement also has value as a record of commitment to non-proliferation, and may also serve as a springboard to further cooperative initiatives in countries such as, India, Pakistan, Iran and North Korea. However, such new initiatives require high level political will and increased funding.

Overall, given the amount of fissile material that remains in precarious locations around Russia, funding for non-proliferation initiatives remains inadequate. According to Graham Allison, at the current rate it could be 2020 before all of Russia's nuclear weapons and radioactive materials are fully secured.[42]

Conclusions and recommendations

• Improve the provision of information

The threat of a dirty bomb attack in a major city is real and should not be played down. However, the true nature and consequences of such an attack need to be objectively clarified, especially for the general public. Too much of the information relating to the dirty bomb threat in the public domain is vague and inaccurate. In the event of an attack this could seriously aggravate an already difficult situation. It is obvious, but bears repeating, that the provision of accurate information is extremely important.

There is a difficult balance to be drawn by governments here. While they need to be seen to be doing something to plan for a dirty bomb attack and provide for emergency service training, they run the risk of being ridiculed for either overstating the potential for attack, possibly for political gain, or not providing sufficient funds and support for those who would be in the front line of having to respond to such an attack.

• Sustain political will and increase funding

Sustained political will at all levels and increased funding are central to any plans to keep radiological materials out of the hands of terrorists. The securing and reduction of radioactive material in the former Soviet Union is of particular concern, as substantial

quantities of radiological sources remain in run-down and poorly guarded installations. The initiatives that have been established to deal with these materials must not be sidelined or downgraded, politically or financially.

- **Accelerate implementation**

The speed of implementing these initiatives must also be increased. The longer sensitive materials remain vulnerable, the higher the chances that they may fall into terrorist hands. The securing and disposal of radioactive substances often involves a considerable amount of red tape, as issues relating to the financial value of materials, environmental impact, liability, site-access etc. slow up the process. Firm commitment by all parties is required to more effectively overcome these impediments.

- **Harmonise international legal standards**

International harmonisation of legislation relating to the security of sensitive materials is another area that needs attention. National legislation is undermined if it can be easily circumvented by terrorists operating from countries with less effective laws. Ideally such legislation should also be legally binding, and should merge easily with international initiatives.

- **Improve cooperation between law enforcement and intelligence agencies**

Effective co-operation between law enforcement and intelligence agencies is an important ingredient in both preventing a terrorist dirty bomb attack and in response planning, both long-term and in relation to specific events. This applies at both the intra-national and international levels. Such co-operation is often difficult to achieve, either because of inadequate organisation structure, inter-agency rivalry or human error. For example, in the Boston dirty bomb case in January 2005, the FBI informed two offices of the Department of Homeland Security about the perceived threat, but not the headquarters of Homeland Security. This led to confusion when "local officials, reporters and members of the public began querying federal agencies". The poor communication that often characterises the relationships between intelligence agencies, particularly those in the same country, is a serious problem that needs to be addressed.

- **Prioritise prevention**

Prevention of a terrorist attack is of course better than having to deal with the aftermath, although effective response planning is also necessary, both as a deterrent and to minimise the impact of an incident if prevention fails. At national and international levels various initiatives and important pieces of legislation have been introduced to deal with the dirty bomb threat. However, more needs to be done.

Preventive efforts will, to a large extent, remain clandestine and be conducted by national security agencies, often in collaboration with agencies in other nations. Once again, governments are faced with a difficult balancing act - this time with the potential clash of upholding national and international law and civil liberties while needing to operate secretly and, perhaps, in very exceptional circumstances, unlawfully to prevent an impending crisis.

Endnotes

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