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Report No. 2000/02: Chemical, Biological, Radiological and Nuclear (CBRN) Terrorism

December 18, 1999

This paper uses open sources to examine any topic with the potential to cause threats to public or national security.

Introduction

1. In the wake of the March 1995 sarin attack on the Tokyo subway, as well as other recent high-casualty terrorist incidents, governments and publics alike are viewing with growing concern the potential threat posed by chemical, biological,

radiological, or nuclear (CBRN) weapons in the hands of terrorists. How easy would it really be for an individual terrorist or terrorist group to manufacture or otherwise obtain such weapons? Perhaps even more important: How easy would it be for them to deliver such weapons, or disperse such agents, and to what effect? The answers obviously depend on the type of weapon or agent that one is talking about. The experience of the Aum Shinri Kyo suggests that the manufacture of an effective nerve agent-even one for which the "recipe" has been widely known for some time-is not quite as easy as commonly believed. The sect also clearly ran into technical difficulties in its various attempts to manufacture and effectively disperse biological agents, such as botulinum toxin and anthrax-which at least partly explains its later focus on chemical weapons.


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Discussion

Acquisition of CB Materials

2. A wide range of potentially deadly chemical and biological (CB) agents including various insecticides, industrial chemicals and potent toxins such as ricin may be relatively easy to produce or otherwise acquire. Some deadly pathogens can be obtained through the mail from scientific supply houses; in other cases it is possible to harvest them from nature or to "grow your own" with relatively unsophisticated equipment and limited expertise. It may also be possible to steal deadly agents from civilian research facilities or military stockpiles, as reportedly has occurred-in the case of chemical weapons, at least-in the former Soviet Union. Nor is it inconceivable that a state sponsor of terrorism-most if not all of whom have active weapons of mass destruction programs of their own-would be willing deliberately to provide terrorists with CB weapons or materials, if it could convince itself of "plausible deniability" while using a surrogate group to inflict a devastating blow on an enemy.


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Problems of Dissemination

3. The effective dissemination of CB agents may be more difficult than their manufacture. For example, the popular scenario involving poisoning the water supply of a major metropolitan area does not appear very feasible, given the large quantities of agent that would be required and the various filtering or purification measures usually in place. It is also true that the lethality of some types of highly toxic agents depends crucially on the type of exposure; and that some of the deadliest agents, while perhaps suitable for individual assassinations, may not easily be adapted for use in a mass-casualty attack. The open-air release of an agent may be crucially affected by unpredictable or difficult-to-predict meteorological conditions, while even the release of an agent in a confined space may be subject to the vagaries of individual doses and air circulation patterns. Nevertheless, credible scenarios can be devised that, assuming optimal meteorological conditions and the most effective means of dispersal possible, could result in staggering numbers of fatalities, ranging well

into the thousands for chemical agents and into the hundreds of thousands-or possibly even millions-for biologicals.


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Nuclear Materials

4. In general, CB agents are considered to be cheaper and easier to produce or otherwise acquire than would be nuclear weapons. Nevertheless, the seizure in recent years of special nuclear materials on the black market in Europe, albeit in quantities insufficient to construct a nuclear explosive device, has lent new credibility to the threat of nuclear terrorism as well. The "experts" appear to disagree on whether a small group of technicians such as might be brought together by one of today's terrorist groups would be able to overcome the engineering difficulties of constructing a nuclear explosive device. Theft of an intact nuclear weapon is not considered very likely, given the stringent security measures in place in most of the nuclear-weapon states, although political instability and socio-economic decay in some of them-including the former Soviet Union-must remain of some concern. Tactical nuclear weapons, whose security features may be more vulnerable to tampering, are of greater concern than strategic nuclear weapons in this regard.¹

5. Of greatest concern from the viewpoint of a potential nuclear explosive capability may be the security of weapons-usable fissile material held in research institutes, naval fuel depots, and other similar nuclear facilities, especially in the former Soviet Union (FSU). Despite considerable expenditures through the US Nunn-Lugar "Cooperative Threat Reduction" programme and aid by other Western states, the security of some of these installations in the FSU remains inadequate. However, a more likely threat of nuclear terrorism would be the radiological one, that is, the dispersal of radioactive substances to contaminate air or water, or to render unusable a particular area or facility. Radioactive materials that could be used for such contamination are available from a wide range of relatively non-secure facilities, including hospitals, medical and research laboratories, universities, waste dumps, and so forth. Although some types of contamination may be more difficult to achieve than commonly believed, given the widespread public anxiety about nuclear material in any form, the mere threat of such use of radioactive materials could be a potent terrorist tool. The same considerations would apply to attacks on nuclear power facilities or on shipments of nuclear materials that could threaten radioactive release.


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Past Use of CBRN Materials by Terrorists

6. There has been some limited use of CB agents by terrorists in the past. Left-wing extremists in Europe have threatened their use against civilian populations or military targets; right-wing extremists in North America have conspired to poison city water supplies and have succeeded in acquiring quantities of deadly agents; state sponsors of terrorism reportedly have developed CB weapons suitable for terrorist use; food products have been deliberately contaminated, in some cases causing human casualties and/or considerable economic losses;

insurgent groups in various parts of the world have sometimes used CB agents against government forces; and individual assassinations have been carried out by such means.

There have also been some limited attacks on nuclear power facilities worldwide; numerous unsubstantiated threats to trigger a nuclear explosive device; and at least one reported case of the use of radiological materials-albeit in a very limited manner (the placing of a cesium capsule by Chechen rebels in a Moscow park)-by terrorists.

7. Nevertheless, despite widespread publicity about the threat, there have been few actual attempts by terrorists to cause mass civilian casualties using CBRN agents. Exceptions have been the typhoid poisoning of 750 people (none fatally) by the Rajneesh sect in Oregon in 1984; and the various attempts by the Aum Shinri Kyo using both chemical and biological agents, the most "successful" of which resulted in 7 dead and 270 injured in Matsumoto, and 12 dead and 5,500 injured in Tokyo. Far more common have been unsubstantiated threats, hoaxes or relatively low-level incidents causing few if any casualties. However, as information and capabilities spread widely through such means as the Internet, it is becoming increasingly difficult for the authorities to distinguish between a mere hoax and the real thing. This raises all kinds of tough questions about the appropriate responses to such threats, which may be extremely disruptive for normal, day-to-day activities, and may afford terrorist individuals and groups a potent instrument against society, even in the absence of a real capability or willingness to carry out an actual attack.


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Current Trends

8. While some traditional terrorist groups are likely to continue to be constrained by such factors as the unfamiliarity of the weapon and its questionable political utility, the likelihood of CBRN weapons use by other terrorists is both considerable and growing, given trends such as the following:

- the recent increase in high-casualty, indiscriminate attacks in general (as exemplified by the World Trade Center, Oklahoma City, and East Africa embassy bombings);
- the proliferation of NBC weaponry, materials, expertise, and technology worldwide, including the availability of materials and weapons expertise from existing or former state programmes; and
- the increase in inter-ethnic and religiously-inspired violence, with fewer humanitarian inhibitions.

Of particular concern is the emergence of groups-such as apocalyptic religious cults, right-wing extremists, and ad-hoc extremist Islamic groups-whose aim is not to bargain with governments nor to win over public opinion to their point of view, but rather to cause the maximum possible amount of damage and disruption to a people or a system that they consider especially abhorrent. Many

of these groups are by nature difficult targets for intelligence agencies, reducing the chances of advance warning of, or the opportunity to prevent, such an attack.

9. Terrorist interest in the use of CB weapons has grown substantially since the Tokyo subway attack. In testimony before a US Senate committee in September 1998, FBI Director Louis Freeh stated that the FBI had investigated over 100 CBRN cases during 1997, a tripling of the 1996 figure. The following month, another senior FBI official noted that whereas 68 new investigations into the use or threatened use of CBRN materials had been initiated in 1997, the number had already exceeded 86 in 1998. Director Freeh commented in February 1999 that the FBI dealt with an "anthrax warning letter" somewhere in the US almost every day.

10. There have also been reports of new or renewed interest by a number of traditional international terrorist groups, including the Palestinian Islamic Jihad, Hizballah, the Algerian Armed Islamic Group (GIA), Egyptian Islamic Jihad, Hamas, Sikh and Chechen terrorists, the Kurdistan Workers' Party (PKK), the Khmer Rouge, and the Liberation Tigers of Tamil Eelam (LTTE). These reports are usually quite vague, and not all of them have been particularly credible, but the trend is worrisome. Senior US government officials have publicly asserted that the terrorist financier Osama bin Laden has been actively seeking chemical, biological, and nuclear weapons for use against Western targets. The recent apparent resurgence of the Aum Shinri Kyo in Japan is also troubling, given the technical knowledge possessed by some of its remaining followers and the possibility of yet-undiscovered stocks of CB agents or precursors.


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Conclusions

- although it is impossible to estimate the precise likelihood of a mass-casualty terrorist attack using CBRN materials, the technical obstacles to such an attack are by no means insuperable. It appears to be a case not of "if," but rather of "when," the next such event will occur;
- based on a combination of trends in both capabilities (or the availability of means) and motivations, as well as empirical evidence of actual interest, the threat appears to be growing;
- as in the past, such an attack is perhaps most likely to come without warning from an individual or group of which we have been previously unaware;
- despite increased attention to the threat since the Tokyo subway attack, society remains highly vulnerable to such attacks, the potential consequences of which are horrendous in the extreme; and
- even hoaxes-which are increasing in number and becoming progressively more credible-can cause enormous disruption to society, in some cases perhaps achieving the ends of the terrorist even without an actual attack.

Canadian Interests

11. While Canada has not experienced any major, mass-casualty incidents of CB terrorism, there have been threats to contaminate the water supplies of various localities, as well as fairly frequent claims of product contamination by animal-rights or environmental extremists. Such contamination has usually only been threatened rather than actually carried out, although the threats have sometimes resulted in substantial economic losses as products were withdrawn from the market. In April 1993, Canada Customs at the Alaska-Yukon border seized 130 grams of the deadly poison ricin from an American possessing neo-Nazi literature and later linked to "survivalist" groups. More recently, various news media outlets and guide outfitters received envelopes containing razor blades purportedly coated with rat poison from an extremist animal- rights group. Gas masks and chemical protection suits were among the items seized from the cache in B.C. of a US right-wing militia group in October 1996. And unsubstantiated threats to use "chemical or bacteriological products" against Montreal in the name of the "World Islamic Front" caused brief disruptions in that city in March 1998.

12. To date, there have been no significant incidents linked with the threat or use of nuclear terrorism in Canada. There have been suggestions in the past that terrorists might attack Canadian nuclear facilities according to the theory of the "path of least resistance," since they are less well-guarded than their American counterparts. However, as with most types of terrorism, a sophisticated and well-organized group is believed more likely to target the US directly (although the possible use of Canadian territory or resources in such an attack remains a concern, of course).

13. In general, Canada cannot be immune from the broad international trends in this area. We do have our share of individuals or groups, such as the Order of the Solar Temple, that can be described as espousing "doctrines of irrational escapism." While we do not have a home-grown militia movement as virulent as that of our southern neighbour, we do have our share of neo-Nazis, and have unwittingly provided in at least one case a place of refuge and stockpiling for one of the American militia groups. Finally, while Canada may not constitute as lucrative a target for foreign terrorist groups as the USA, many such terrorist groups do have some kind of presence, if only playing a supporting role, in our country. And Canada's continued international activism in peacekeeping efforts around the globe, as well as the possible spillover from ethnic conflicts elsewhere in the world, could conceivably make us the target of an externally-inspired, mass-casualty terrorist attack.

14. Based on past examples, the type of CBRN terrorist incident most likely to be experienced by Canada in future is a hoax or threat rather than an actual attack, or a relatively low-level instance of product contamination rather than a mass-casualty outrage. As capabilities and information spread, however, it is becoming increasingly difficult for the authorities to distinguish between a mere hoax and the real thing. And, in the end, Canada remains as vulnerable as any of the other Western industrialized states to the kind of nightmarish, mass- casualty CBRN terrorist attack that until recently was confined to fiction.

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¹ "Strategic" weapons are those intended for attacks on an opponent's homeland military infrastructure, economic base, and/or population centres; "tactical" weapons for battlefield use against concentrations of military force. [\[Return\]](#)

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