BBC NEWS

Preparing for a dirty bomb attack

By Frank Gardner
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The authorities in Britain and the US are preparing for the increasing possibility of a radiological dirty bomb being detonated by terrorists.

Pagers to detect personal radiation exposure have already been issued to some ambulance services in Britain.

A dirty bomb would use radioactive material wrapped around conventional explosive.

Although it is estimated that the inclusion of radioactive isotopes would cause very few immediate additional casualties there could still be a major psychological effect, with some people trying to flee the affected area and local businesses seriously damaged.

In the worst-case scenario, whole areas could be rendered uninhabitable for up to several months or even years.

But scientists are now developing a number of novel ways of mitigating the likely effects of a dirty bomb. The aim, they say, is to minimise the effect on human lives.

"Today we see the use of home-made improvised explosive devices: tomorrow's threat may include the use of chemicals, bacteriological agents, radioactive materials and even nuclear technology," Dame Eliza Manningham-Buller, MI5 Director-General, said in a speech in London last November.

Intensive research

At the United States' Argonne National Laboratories, hidden behind a guarded perimeter, scientists in white protective suits burst out of a van and prepare to spray a fine liquid plastic on to the surface of a wall.

> **There's been a lot of research work but it has been escalating over the past few months**
> Sandra Bell
> Royal United Services Institute

It is an exercise. The wall has not really been contaminated and the world has yet to experience a dirty bomb for real.

But emergency planners are now training for when terrorists might one day detonate a "Radiation Dispersal Device", or RDD.

Left unchecked, its after-effects could contaminate whole streets. Sandra Bell is an explosives expert at the UK's Royal United Services Institute.

"The British government are getting increasingly concerned about an RDD," she says.

"We have a long history of getting prepared and there's been a lot of research work but it has been escalating over the past few months."

Locking down radioactivity

Over at the Argonne laboratories, scientists are now spraying their plastic polymer gel on to a wall. Jayne Shelton is President of the company that developed it.

ANTI-DIRTY BOMB DEVICES

Bio-dosimeter assessment tool: available through US government
Ocular scanner: prototype
Argonne super-absorbent gel: seeking a commercial developer
Polymer isotron spray: commercially available
Sirad personal dosimeter card: commercially available
A new radiation pager is also being developed in the US

"The purpose of this coating is to lock down radioactive particulates to prevent contamination spread," he says.

"The two issues you have with a dirty bomb release are the spread of the contamination and also the contamination of the public and first emergency responders.

"Ideally you'd have a fleet of vehicles on the ground that would be supplied with our coating, have the spray equipment to disperse it over a large area.

"You'd also have aircraft to spray it on the top of the plume to lock it down to the surface. And the whole purpose of this being to lock it down into a solid form such that when the first responders come back in by foot or by vehicle there's no recontamination."

One of the problems with radioactive contamination is you can't see it.

So many emergency workers fell ill at Chernobyl in 1986 because they did not realise how badly they were being radiated, in many cases fatally.

But scientists in the US have been working on ways to detect radiation immediately after a dirty bomb.

The technologies that we have developed will help decrease the panic and increase the peace of mind and help with the clean-up
Jeff David
Interagency US Technical Support Working Group

Under a bilateral deal, they are sharing their findings with Britain.

One of the more portable devices is the commercially available Sirad Personal Dosimeter, as explained by Gladys Klemic from the US Department of Homeland Security.

"You'd carry this like an ID card," she says.

"In situations where there are high levels of radiation this central rectangle would darken, the blue square can be used as a reference to see what the radiation levels are.

"If an emergency responder comes to an event and is carrying one of these he can quickly check and see if he's been exposed to radiation."

Picking up the threat

The ocular scanner is another one of several prototype devices designed to cope with the aftermath of an RDD.

Its development has been sponsored by the Interagency US Technical Support Working Group, linked to the defence department.

We asked Jeff David, the group's deputy director, how these devices would work in a real-life situation.

"If we're in a shopping mall and a bomb goes off, if you were injured you know it, it's obvious," he says.

"You're bleeding from shrapnel. If it's an RDD, you may have received a lethal dose but you don't know what you've been exposed to unless you're properly prepared in advance, and the technologies that we have developed will help decrease the panic and increase the peace of mind and help with the clean-up."

Funding battle

Finally, there is the Argonne super gel, a highly absorbent substance sprayed on to a contaminated building.

It is designed to tackle the most dangerous radioactive materials that have penetrated right into the concrete.

It literally sucks out the radioactive particles then removes them with a wet vacuum before they are disposed of as radioactive waste.

In theory, that means a building can be decontaminated in days instead of waiting weeks or even demolishing it altogether.

But here lies the problem: until terrorists actually detonate a dirty bomb, the funding for dealing with one is thin on the ground.

Some equipment is now being distributed, in both the US and Britain, but privately scientists question whether it will really be enough to cope with a full-scale radiological disaster.

DEALING WITH A DIRTY BOMB

Isotron spray
1 Plastic polymer sprayed over radioactive contamination seals it on to surface, preventing further contamination
2 Hardened gel is then peeled from surface, taking surface contamination with it
Ocular scanner
3 Detects and identifies degree of contamination and gives a prompt read-out on screen
Argonne super-absorbent gel
4 Sprayed on contaminated surface and sucks out even deep-seated radioactive particles
5 Gel retains radioactive material and is removed with a wet vacuum for disposal
Personal dosimeter
6 Rectangle in centre of device darkens if high radiation levels detected and indicates extent of contamination

UK viewers can watch Frank Gardner's full report on the Ten O'Clock News on BBC One on 3 August. It will also be available as a stream off this page after the programme.

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