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# STUDY ON SECURITY MANAGEMENT AGAINST WEAPONS OF MASS DESTRUCTION

Toki UDAGAWA

Ph.D Candidate

Department of International Studies

Graduate School of Frontier Sciences

The University of Tokyo

Mail: tokiju-asm@live.jp

## **ABSTRACT:**

The attacks of September 11 in 2001 gave a great shock to the world. After the incident, airport security is much higher and stricter than ever before. Even though you are not American citizens, you may remember the terrorism of the 9.11. On the other hand, do you know the terrorism by *AUM Shinrikyo*, on the Tokyo Metropolitan Subway in 1995? In our society, this was the first terrorism, which was used a chemical weapon, *sarin* gas, to the general public. When *AUM Shinrikyo* members attacked subways, Japanese People were in panic. However, this attack was occurred over 15 years ago, so even Japanese people become forgetting it. This is because the Japanese people have never experienced such terrible terrorism since 1995. On the other hand, one of current global issues is how to handle global terrorism. Today, terrorists try to attack our society by any means. As a last resort, they are able to use CBRN (chemical, biological, radiological, nuclear) weapons of mass destruction if they would like to. "If our society is attacked by these weapons..." We must consider of the worst thing and be ready for any situation against terrorism.

This paper discusses how the society prepares for CBRN terrorism. As an example of terrorist attacks by CBRN weapons, "1995 Tokyo *Sarin* Gas Attack" is explained. The attack aimed to Tokyo Metropolitan Subway system, so it has much information for transportation security management and is instructive for security and safety. In this paper, I also focus on detection equipments in airport security system. Current hot topic on airport security is how to detect explosives. In near future, however, we will need to discuss on CBRN terrorism against airports. This paper may be effective for the next era of our social security management.

**KEYWORDS:** airport, security management, CBRN weapons, detection equipment, terrorism

## **1. INTRODUCTION**

In 2001, the attacks of September 11 occurred in the US. The target of the terrorism was the US

homeland, US citizens and their pride as Americans. Using as powerful bombs, four airplanes were hijacked by suicide bombers. Two planes clashed against the tower of the World Trade Center

Complex, and the other two crashed on ground. Over 3,000 people killed. The attack gave great shock to American people.

After the 9.11, airport security system has dramatically changed in the world. Security alert level at airports was the highest immediately, in Japan too. The airport authority started to develop new security systems for taking preventive measures against terrorism and to introduce new equipments to find explosives and the IEDs (improvised explosive devices = handmade bombs).

In airport security, finding explosives is currently important. Security screeners especially check electrical appliances, computers, shoes, outerwear and liquid at the airport checkpoint because these items may become one device of explosives. Whenever terrorism occurs, security alert level is raised. Current security level is much higher than before, and in short, our society is much more protected before by strict security management. Now, one question comes; is the management enough for combating terrorism? Today, terrorists' plans and methods are beyond our imagination. For terrorists, nothing is taboo. They can use any measures for achieving their own purpose.

In fact, the measure corresponding to invisible threats, including CBRN (chemical, biological, radiological, nuclear) terrorism, is not satisfactory even in airport management with high level security system. Since terrorists are able to choose the use of CBRN weapons of mass destruction, the authority considers of the threats of CBRN terrorism against our society.

This paper focuses on the preparations of CBRN terrorism. Firstly, it states the hot-button of current airport security system and shows the trend of terrorism. Then, as the example of the threat of CBRN terrorism, "1995 Tokyo *Sarin* Gas Attack" is explained. After discussing what the relevant agencies need to prepare for terrorism toward

airports, this paper finally offers for correspond to CBRN terrorism in time to come.

## 2. Global Challenges

After the attacks of September 11, the business market related to airport security became active, and airport security equipments made rapid progress. Major manufacturers in Western countries began to make advanced security equipments with new technologies. The airport authority started the trial for the performance of new equipments and installed them. At that time, for airport security, two important equipments were developed; Explosives Trace Detection (ETD) and integrated Explosives Detection Systems (EDS). ETD is the extremely sensitive scanning device. At the checkpoints, security screeners swab a piece of luggage (Figure 2.1) or several puffs of air are released on the passenger (Figure 2.2), and then ETD can analyze for trace explosive particles on luggage and passengers. When it detects the trace of gunpowder, the alarm will come.



Figure2.1: ETD for Luggage (TSA Website)



Figure 2.2: ETD for Passengers (TSA Website)

EDS is for large baggage inspection (Figure 2.3). The system has 3DX computed tomography (CT) technology and X-ray to detect explosives such as detonators and C4, known as a plastic bomb.



Figure 2.3: EDS (TSA Website)

These equipments introduced international airports in the Western countries, and Japan has the equipments of figure 2.1 & 2.3.

Recently, liquid screening is also concerned and discussed in airport security management.

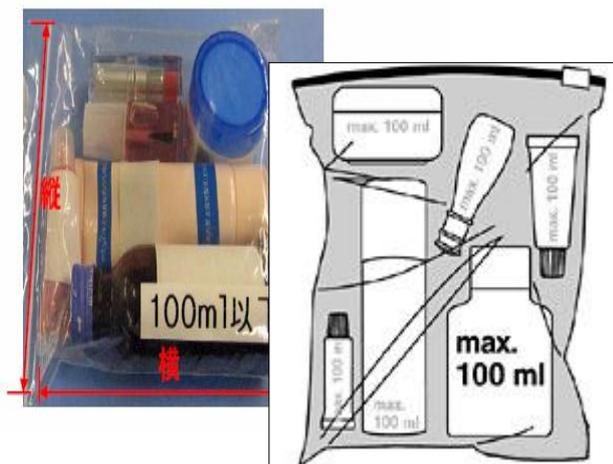


Figure 2.4: Aviation Security Rules for Liquid (Japan Civil Aviation Bureau Website & Swiss International Air Lines Website)

In 2006, terrorists, who had a plot for the terrorism against airplanes by liquid explosive bombs, are arrested in England. Airport alert level was raised immediately like the situation of 9.11. As countermeasures against terrorism by liquid

explosive bombs, the airport authority controls liquid products such as aerosol and gels on board with passengers. International flight passengers are requested to give up for bringing any liquid products with the exception of bottles 3 ounces or smaller (or 100 ml) in 1 quart sized transparent zip top bag (Figure 2.4).

Even under strict security regulations, another terrorist attack occurs in succession. On December 25 of 2009, a suspected terrorist brought explosives on board. It is said that the terrorist is related to Al-Qaeda, and the US people must remember the threat of the 9.11 attacks. After the Christmas incident, new security equipments began to introduce at airports in the Western countries. In the US, the Transportation Security Administration (TSA) has piloted advanced security equipment at airports since 2007. The advanced imaging technologies, which are millimeter wave technology (Figure 2.5: left) and backscatter technology (Figure 2.5: right), “can detect a wide range of threats to transportation security (TSA Website).”



Figure 2.5: Millimeter Wave & Backscatter (TSA Website)

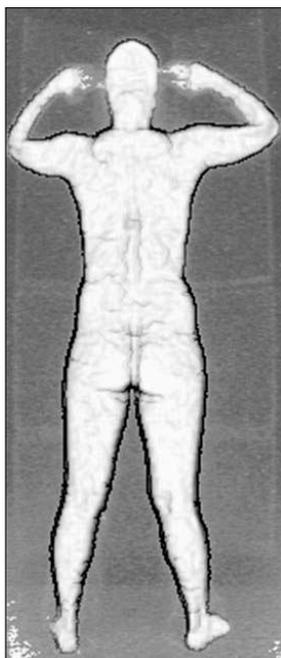
Security screeners can detect metallic and non-metallic threats such as weapons, explosives and other articles without physical contact. By using these new equipments, however, the image of a body line is clearly

shown on the screen. Although privacy issues have been discussed for a long time (Figure 2.6 & 2.7, Pietra & Callahan, 2009), by new technologies, our flight safety is more protected. Under the current social conditions, security may be more important than privacy.



Figure 2.7: Backscatter Image

Figure 2.6: Millimeter Wave Image



Thus, in airports, finding explosives is currently the most serious concern of counterterrorism. In addition to the thinking of explosives, the airport authority must consider of the possibility that terrorists may use weapons of mass destruction. For terrorists, there is no taboo in their own world. Before they use these weapons, the authority needs to understand how to control them and how to prepare for the worst thing.

### 3. New Era—Weapons of Mass Destruction

#### 3.1 Threat of Terrorism

Today, the threat of terrorism remains still high alert level although a nation has good international cooperation and an encircling net with other nations. Terrorists attack the general public and important facilities. The targeted people are mostly innocent and faithful citizens who have no any relation to terrorist group. The attacked important facilities are generally military installations, an official residence of the Prime Minister, nuclear power plants, hotels, stations and airports. Terrorists understand that it is easy to attack defenseless people and that the impact of terrorism against important facilities is huge (Table 3.1).

Table 3.1: Recent Terrorism against the General Public

<u>Date</u>	<u>Country</u>	<u>Target</u>	<u>#of Deaths</u>
Jul. 2006	India	Train	186
Jul. 2005	UK	Train	52
Mar. 2004	Spain	Train	191
Oct. 2002	Indonesia	Downtown	202
Sep. 2001	USA	Airplanes	2973

Transportation security management, especially of airports, has been greatly influenced by global terrorism. Current airport security system is only for the terrorism by explosives, not by CBRN weapons. Although all airports are forced to take measures against global terrorism, the security system lacks anti-CBRN terrorism strategy.

Japan has the worst model of unprecedented terrorism. Japanese people experienced the terrorism by using a chemical weapon. The attack was done by a cult religious group, *AUM Shinrikyo*, and their tactics made the great impact over the world. Owing to the terrible attack by *AUM* members, not only Japanese society but also other nations understood

how prevention system against terrorism is important.

### 3.2 Tokyo Sarin Gas Attack

In the morning of 20 March 1995, Tokyo Metropolitan subways filled to capacity. The crowded trains were attacked by *AUM Shinrikyo*. The cult members released *sarin* gas inside trains, which were on *Marunouchi*, *Chiyoda* and *Hibiya* subway lines. As soon as possible, in the case of terrorism by chemical warfare agents, “detection and identification are important” (Seto, 2006). In Japan, however, this was the first and unique experience for first responders, the police and firefighters, so on-site detection was unsuccessful. Because they could not detect which gas released immediately, they mistook the approach toward the gas and the treatment for injured people (Inoue, 2003). At a later time, on-site sample liquid was transferred to the FSL (the Forensic Science Laboratory of Tokyo Metropolitan Police Department). When the gas was detected as *sarin* at the FSL, it had already spent two hours since the gas released (Seto, 2006).

Under the difficult situation on the site, police officers, firefighters, uniformed members of the Self-Defense Forces and medical team staff made all possible efforts to rescue the people. During two hours, however, because of the lack of information about the incident, on-site people were not able to know that the gas was *sarin*. They did not know how dreadful gas was released there.

As a result of the *AUM* attack, 12 people died and over 5000 people injured. For our global society, this was the first terrorism model, which terrorists used chemical warfare agents toward the general public.

### 3.3 Learning from the Tokyo Sarin Gas Attack

If *AUM Shinrikyo* members used explosive bombs,

the site management was not difficult. Since Japanese people had experienced bomb attacks before, first responders could control of on-site conditions better. Unfortunately, terrorism by *sarin* gas was the first experience for our society. They needed time to conclude what kind of agent was released, so they could not prevent secondary infection soon. On that occasion, people on the scene understood that the establishment of rapid detection system was important against chemical terrorist attacks.

Against the terrorism by chemical weapons, the countermeasures are classified three management stages (Seto, 2006); crisis management, consequence management and incident management (Table 3.2).

Table 3.2: Three Management Stages against Terrorism by Chemical Warfare Agents

<b>Crisis Management</b>	Before Terrorist Attack a) profiling b) monitoring c) border control d) security checks e) emergency training
<b>Consequence Management</b>	Aftermath Terrorist Attack a) on-site detection b) life saving c) investigation d) prevention for secondary infection
<b>Incident Management</b>	After Terrorist Attack a) laboratory analysis b) precise report c) feedback

Even though each management stage operates completely, there are no perfect countermeasures against terrorism. Because terrorists do not have taboo today, they work out new scheme in various ways and at various places. When *AUM* members attacked Tokyo subways by *sarin* gas, Japanese people could not understand soon what happened. At

that time, in addition, the three management stages (see Table 3.2) did not work among related organizations and agencies. If each stage does not operate in case of massive terrorism, the damage expands rapidly and immediately. The *AUM* attack is the good illustration to explain the importance to operate each stage.

#### 1) Crisis Management

Before the Tokyo *sarin* gas attack, the National Police Agency (NPA) has already kept their eyes on *AUM Shinrikyo*. The NPA monitored *AUM* members and checked their activities. However, *AUM Shinrikyo* evaded the meshes of the law and was active. Unlike the aviation security system in airports, rail transportation does not have severe security checks at stations. In short, every people can enter a station and take a train easily. On the first management stage, monitoring for suspicious persons and security checks at public places are not enough, and the first stage was simply broken through by *AUM* members.

#### 2) Consequence Management

Aftermath the *AUM* attack, people were thrown into confusion. According to the condition of injured people, it was clear that the incident happened because some chemical warfare agents were released. The first responders, the police officers and firefighters, tried to detect immediately what was released. To grasp the serious situation there, the on-site detection was required the exactness and the quickness. Since they have never experienced *sarin* gas attack, however, they went wrong. Until two hours later, the FSL detected the ingredient of *sarin* gas, people did not know about the released gas. Therefore, personal protection and medical treatment on the second management stage took effort through trial and error.

#### 3) Incident Management

After the *AUM* attack, the agents were brought to the FSL for chemical analysis. Then, people knew that the released gas was *sarin*. The police investigated the incident and concluded that the attack was done by the *AUM*. On the final stage, the result of detailed analysis and investigation was reported. The report provided many data on *sarin*, and it was useful data for terrorism by chemical warfare agents in future. Because Western countries understood that one of the most countermeasures against terrorism is the feedback to stop security holes and weakness, the authorities of Western countries came to Japan and gathered information and data on *sarin* more eagerly than the ones in Japan (Inoue, 2003).

Thus, each nation has continued to effort for combating terrorism, but terrorists take advantage of the social vulnerability and weak points in a nation. When terrorists attack our society by chemical weapons like *sarin* gas, fast on-site detection is the most necessary for life saving and initial investigation. We learn and know it owing to the *AUM* attack.

Today, combating terrorism is one of the global urgent issues. In Western countries, the development of on-site chemical detection equipments with high technology is progressing. In the US, the counterterrorism fund has increased since 1996 because of the terrorist bombings of the federal building in Oklahoma City in 1995, and in addition, the federal government has created “programs to train and equip local first responders to prepare for possible CBRN terrorist attacks” (Gebicke, 1999). In Japan, the National Research Institute of Police Science, universities and private companies research and challenge to develop new equipments together for rapid detection of chemical and biological agents. Moreover, after *sarin* gas attack, the

countermeasures against terrorism and special incidents caused by radioactive materials, biological agents, hazardous articles and toxic substances are strengthened. For CBRN terrorism, the introduction of CBRN detection vehicles and portable equipments (Figure 3.1), such as portable gas chromatograph mass spectrometers (GC-MS) and infrared spectrometers (FT-IR), is advanced in Self-Defense Forces, the Tokyo Fire Department and some Police Departments.

Figure 3.1 Portable Equipments against CBRN Terrorism (TFD Website)



### 3.4 Security Management in Airports

#### 3.4.1 The US System

For airport security management, the annex 17 of ICAO (International Civil Aviation Organization) is significant. In the annex, the provisions for safeguarding international civil aviation against acts of unlawful interference are written, to the Convention on international civil aviation by ICAO. According to the annex 17, the provisions of the Standards and Recommended Practices in the annex “are to be applied by contracting states” (ICAO Annex 17, 2006). ICAO contracting states are now 190 in the world. They shall ensure that the provisions are applied to their own domestic and international operations because the standards are the

minimum requirements for keeping the same level of aviation security among the states. Following the annex is the duty of ICAO contracting states.

On the other hand, each nation has different airport management style. For developing countries like Indonesia and Brazil, it is difficult to conform in accordance with the ICAO Standards because of the lack of budget for security management. The US certainly recognizes the different balance of security system from other nations. Therefore, airport security management at the US airports is strict toward passengers who enter the US from other nations. In addition, the Transportation Security Administration (TSA), which is the Federal Agency of the US, requests to obey the federal security regulations to others, so even passengers who depart from Narita international airport, Japan, they are screened by the TSA procedures at Narita. For profiling passengers, the TSA also uses federal information data. By the data, the TSA screens all passengers, who would like to enter the US, are absolutely checked at each nation before departing, even outside the US. The TSA does not believe the security management of other nations because an international airport is a melting-pot that passengers come from all parts of the world.

If terrorists release *sarin* gas inside airports, can the airport authority correspond to the unexperienced severe situation under current airport security management? Even in the US airports, unfortunately the relevant agencies may not be able to handle the worst situation skillfully. For a long time, the agencies have focused on explosives detection. They have been interested how to detect explosives more quickly and exactly without false alarm. They have made every effort how they can find explosives and improvised explosive devices, so the technologies for explosives detection (see Figure 2.1~2.7) were developed and introduced at airport security checkpoints in Western countries. Even

the airport authority officers in the US, they do not have paid attention to CBRN a lot. Now, however, the people must prepare for any terrorism not only visible explosives but also invisible threat like chemical and biological weapons.

Airplanes bring passengers including a suspicious person. Everybody can come to an airport from all over the world. What should the authority take countermeasures against invisible terrorism? Before entering, passengers' profiling system is effective. Who? How old? Where come from? Why comes? How to buy the ticket? How appearance? By using profiling manual, the relevant agencies screen a person and his/her background, and then they should share the information each other. If the person enters in an airport, monitoring by CCTV cameras or airport security officers is effective. If finally something (invisible CBRN terrorism, etc.) occurs, rapid detection is important. The preparation of the detection system against CBRN terrorism lacks in current airport security management.

### 3.4.2 Japanese System

Narita international airport is the biggest airport in Japan. There are many shops and relaxation spaces. Like the US international airports, however, the airport does not have practical management system against CBRN terrorism. The relevant airport agencies believe that the special task forces of Self-Defense Force or the Police correspond to such terrorist attacks skillfully when the attacks actually occur in airports.

For counterterrorism, the establishment of crisis management working group is important. In Narita international airport, however, the establishment of the working group is difficult because many agencies, including government authorities and private companies, are involved in airport security management. Table 3.3 shows that many agencies

and organizations exist in Narita international airport.

Table 3.3 Duties of Airport Security Management Agencies in Narita

<b>Organization</b>	<b>Routine Work</b>	<b>Anti-Terrorism</b>
<b>Ministry of Land, Infrastructure &amp; Transport</b>	• Civil Aviation & Navigation	• Regulation • Responsible Authority
<b>Ministry of Finance</b>	• Custom	-----
<b>Ministry of Health, Labour and Welfare</b>	• Quarantine	• Anti-Biological Measures
<b>Ministry of Justice</b>	• Immigration	• Border Control
<b>Chiba Prefectural Police</b>	• Policing	• First Responders • Lab. Analysis
<b>Local Fire Department</b>	• Fire Drill • Rescue	• First Responders • On-site Analysis
<b>Airport Clinic</b>	• Consultation	• Critical Care
<b>Narita International Airport Corporation</b>	• Supervising • Administration	• Airport Monitoring
<b>Airlines</b>	• Aircraft Safety	• Passenger Monitoring

Every agency has own regulations and confidential information, so they have complicated relations to other agencies. Unfortunately, it may be hard to integrate all agencies for combating terrorism. Under the current Narita situation, each agency should prepare for protecting Narita airport by own way. The preparation is their duty. In that case, it is necessary to tell other agencies how own agency respond to CBRN terrorism. At least, communication system with other relevant agencies has to improve.

Before terrorism occurs at airport, it is important that each agency recognizes which agency has what responsibility.

In addition to the establishment of the inside security management working group, the establishment of practical relationship with special task units of Self-Defense Forces, the National Research Institute of Police Science and the National Police Agency is also necessary. Although airport agencies do not prepare the equipments against CBRN weapons, the outsiders have fully equipped special task units for combating terrorism. When a serious incident, which occurs in airports, is unmanageable, incorrigible and out of control, good relationship with outsiders is important.

#### **4. Effective Security Management**

In fact, few airports have the defense system against CBRN terrorism today. The lack of defense system is the vulnerability of airport security management. The untouched weak points are not conquered immediately because the security cost must be huge, but the airport authority always has to show defensive attitudes toward terrorists. For our society as same as airports, cautiously, to keep the high level of security management is the most effective to deter terrorism.

There are two points for keeping the effective security management; 1) good relations and communication with relevant agencies, and 2) the development and introduction of new detection equipments.

##### **4.1 Importance of Good Relationship**

In Japan, each agency began to establish close ties with others after the Tokyo *sarin* gas attack although the strength of relations are not enough to fill in vulnerable cracks. The relevant agencies have

seriously discussed on the prevention measures against terrorism, contingency plans, life saving methods and emergency phone trees in the CBRN liaison conference. The agencies get together at the conference and consult each other. In discussion, they should talk about terrorism not only by explosive bombs but also by CBRN weapons. No matter what happens, the relevant agencies have to manage the social security and safety. When a serious incident occurs, it can operate the best way if every agency receives same information and if each agency understands each role.

##### **4.2 Necessity of Advanced Detection Equipment**

In addition to close relations laterally, research, development and introduction (RDI) of detection equipments with advanced technologies must progress more in the world. In Japan, however, RDI is outdistanced in comparison to the Western countries because of five reasons; the difference from the Western countries in 1) national budget for anti-terrorism, 2) CBRN business market, 3) the relations between private companies and the state organs, 4) difficulty for obtaining reagents, and 5) certification system for new equipments. The US and Europe understand that a nation has the responsibility of homeland security, so they spend a large amount of money for counterterrorism. The governments of these nations are closely connected with private companies, which have new technologies, and challenge to develop new detection equipments together. The research institutes on the force and the police are also involved in the experimental process, so it is easy to obtain chemical and biological reagents for laboratory work. When new equipments are completed, the investigation is done by the state organ, which is the charge of equipment performance, thoroughly. After passing the

investigation, the companies can sell the new equipments, which have national certifications, to the world. On the other hand, in Japan, there are no well-established relations between private companies and state organs unlike the Western countries because each organization would not like to take the responsibility for risk and crisis management. Actually, in many countries, crisis management against terrorism is the national mission. Among state organs in Japan, however, the sense of crisis is low.

## 5. Concluding Remarks

In current global society, practical preparation against terrorism is absolutely urgent. By a ship, an airplane, a train and a car, people can move easier than before. They are able to go everywhere they would like to. Under the convenient transportation system, it is impossible to find perfectly (100%) even if a terrorist is in the movement. When we cannot find the one, our lives are put in danger immediately by the only one suspected person.

In Japan, disaster management system has already established because of many natural disasters. By law, the system is laid down in detail. In addition, the authorities of Japan have a rescue robot and equipment for disaster minimization. On the other hand, the readiness to fight future and new terrorism is not enough in comparison with the preparation for natural disasters. Even though Japan has crisis management system, it is not enough. Even though Japan introduces advanced detection equipment, it is not enough. The system and the equipment must unite to be functioned the defense system against CBRN terrorism.

Only Japanese people experienced the terrorism by chemical weapons. The country, Japan, has to lead the world on the basis of the unique experience. As one of developed and as one of industrially

advanced nations, Japan has to have more responsible role for anti-terrorism measures. Then, people, who live in peace and safety anytime, understand what detection system is effective and how the people prepare for terrorism. In near future, not only explosives detection system but also countermeasures against CBRN terrorism may be necessary. Hopefully, the discussion starts soon before CBRN terrorist attacks are realized in our society.

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