

## **Chapter 8**

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# **CBRN Defense: Responding to Growing Threats**



In the wake of the Aum Shinrikyo sarin gas attacks in Japan in 1994 and 1995, and the 9/11 and anthrax mail attacks in the United States in 2001, threats involving the use of chemical, biological, radiological, or nuclear materials/agents have come to be collectively referred to as CBRN threats. This term broadly encompasses not only the traditional concept of NBC attacks—those by nuclear, biological, or chemical weapons—but also terrorist attacks, accidents, or natural disasters. Given these intricacies, this chapter proposes using the term “CBRN defense” to collectively refer to the governance of all domestic agencies involved in CBRN incident response, and to the spectrum of activities tied to that response. In some countries and regional organizations, CBRN response is positioned as defense that spans traditional and nontraditional security challenges, and the capacity to deal with CBRN threats is being raised based on coordination among related agencies, nationally and regionally.

In more concrete terms, with regard to chemical threats, there has been growing concern in recent years regarding the use of chemical weapons in civil wars and acts of terrorism, or by state authorities against their own citizens in order to preserve public order or political stability. The key issues pertaining to biological threats are suspected development of biological weapons by certain states, global pandemics, and the risk of misuse or abuse of evolving knowledge and technologies in the life sciences. The main areas of concern surrounding radiological and nuclear threats are risks such as theft and detonation of nuclear weapons, use of improvised nuclear devices (INDs), sabotage and destruction of nuclear power plants and other nuclear facilities, and terrorist use of radiological dispersion devices (RDDs).

Under these circumstances, in Japan, which has experienced CBRN incidents, including sarin attacks and the Fukushima Daiichi nuclear power plant disaster, diverse national agencies are establishing foundations that may be positioned as CBRN defense. The same applies to the Self-Defense Forces (SDF), at which the enhancement of personnel and the implementation of advanced technologies and equipment are being carried out to deal with CBRN incidents.

Meanwhile, liaison with, and cooperation between, governments of other countries for CBRN defense, as a new security challenge, seem to have been making progress in recent years. In Japan, discussions have taken place about establishing cooperative relationships with, among others, the United States, the European Union (EU), and the North Atlantic Treaty Organization (NATO)

against CBRN threats. Japan has experience in dealing with CBRN incidents; therefore, it is highly likely that Japan, with its experience and knowledge, will make a significant contribution to the sharing of best practices in the handling of CBRN incidents with bilateral or multilateral collaboration.

## 1. The Current Environment of CBRN Defense

### (1) CBRN Threats: Genesis of the Concept

In recent years, chemical, biological, radiological, and nuclear threats have collectively come to be known as CBRN threats, and actualization of the threats as CBRN incidents. These include attacks using NBC weapons, or otherwise called weapons of mass destruction (WMD), attacks by non-state actors such as terrorist organizations, smaller-scale crimes and accidents, and natural calamities. In more detail, chemical threats include the weaponization of sarin and mustard gas for attacks, or an accidental explosion in a chemical plant or a pipeline. Biological threats include the use of *Bacillus anthracis*, *Clostridium botulinum*, and other biological agents for attacks, and naturally generated incidents, including pandemic outbreaks of infectious diseases such as new strains of influenza, and infectious livestock diseases such as foot-and-mouth disease. Recently, the risk of misuse or abuse of evolving knowledge and technologies in the life sciences is also considered as potential biological threats. An example of a radiological threat is the use of RDDs (also called dirty bombs) that disperse radioactive substances used for medical or industrial applications, which are relatively easy to obtain, by attaching them to explosive devices. On the other hand, obvious examples of nuclear threats are attacks by nuclear explosive devices manufactured as weapons (nuclear weapons). Terrorist attacks on nuclear facilities such as nuclear power plants may be considered as being nuclear threats.

The background for the use of such a comprehensive concept is that international terrorist attacks have become radicalized since the latter half of the 1990s. The sarin attacks in Japan by Aum Shinrikyo in 1994 and 1995, which were the first case of chemical terrorism committed by a non-state actor, caused the international community to realize the existence of CBRN terrorism. The concern this posed became more serious at the time of the 9/11 terrorist attacks in the United States in 2001, when it was thought that the Saddam Hussein regime of Iraq, which was suspected of developing WMDs, was supporting al-Qaeda, the terrorist organization

that carried out the attacks. Also in 2001, the anthrax mail attacks that were carried out in the United States subsequent to the 9/11 attacks raised awareness of bioterrorism threats. More recently, other non-state actors, such as the Islamic State of Iraq and the Levant (ISIL), which controls extensive areas in a way unlike any other terrorist groups to date, are believed to be interested in possessing CBRN weapons, which raises great concern among the international community. As a consequence, such incidents, including asymmetric incidents in which the above-mentioned weapons are used, have come to be collectively known as CBRN incidents mainly in the United States.

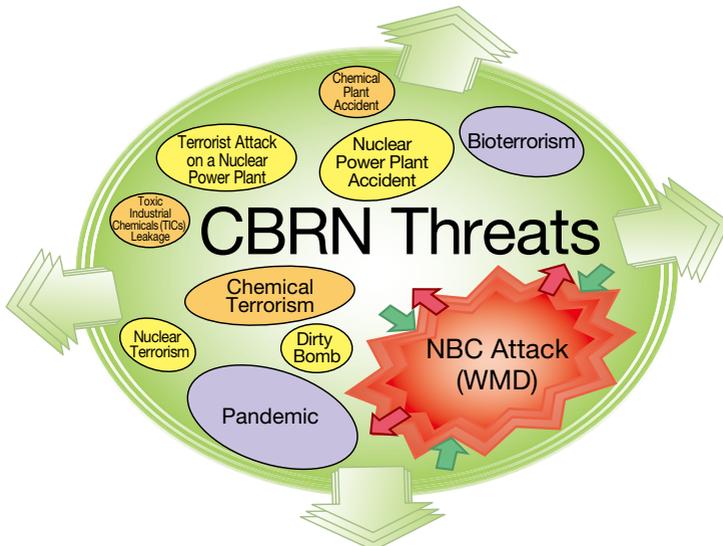
However, there is no single internationally accepted definition or concept for CBRN threats, and each nation has its own interpretation. For instance, some choose to employ the abbreviation CBRNE to take into account the use of explosives (E) such as improvised explosive devices (IEDs) in terrorist attacks. While there is growing awareness of the threat of CBRN terrorism, such terrorist acts nevertheless remain very difficult to implement. In the case of chemical terrorism, for example, the production of chemical weapons in amounts sufficient to cause a massacre requires correspondingly large manufacturing facilities. As for biological terrorism, although the cultivation of toxins and bacteria in the lab is considered a relatively straightforward task, the development of technologies for delivering and dispersing those agents is a formidable undertaking. Therefore, committing acts of CBRN terrorism is not easy. In fact, the frequency of acts of terrorism that have actually occurred using ordinary explosives is much higher than that of acts of CBRN terrorism. Against this background, the EU announced the EU CBRN Action Plan in 2009, but prepared another action plan to strengthen security against explosives in 2012, and since then, it began to treat CBRN and explosives together as CBRNE threats.

There is also a classification method in which the threats posed by CBRN-type materials are categorized as CBRN threats if the materials are deliberately used to inflict harm, such as in NBC attacks by states, terrorist attacks, or criminal acts, or as hazardous material (HAZMAT) threats if the harm stems from accidents or other unintentional situations involving dangerous materials used for industrial and commercial purposes.<sup>1)</sup> The term HAZMAT is widely used by firefighters—who serve as first responders—mainly in Europe and the United States. From the viewpoint of the prevention of CBRN incidents, there is a case for measures against proliferation, such as the Proliferation Security Initiative (PSI), to be incorporated

in CBRN defense, focusing on the threat of the spread of NBC weapons.

Because of the multidimensional nature of CBRN threats, this issue spans many different areas of expertise in addition to security, and the borders between those domains are not always clear. The scope of CBRN threats is expanding responding to changes in the form of terrorism, and significant development of scientific technologies (Figure 8.1). In dealing with such extensive CBRN threats, coordination and synergy among local governments and the relevant agencies, centered on the first responders such as the police, the fire service and disaster medical assistance teams (DMATs), are primarily essential. However, the armed forces (in Japan, the SDF) may handle CBRN threats, depending on the nature, scale, and intensity of the threat. The handling of CBRN threats is, thus, fundamentally an issue of governance of the various sectors specialized in public order, disaster prevention, public health (medical treatment), security, and so forth, and multifaceted viewpoints are required to gain an overall understanding. To conduct proper consequence management at the time of the occurrence of a CBRN incident with the purposes of rapid containment and minimizing damage,

**Figure 8.1. Comprehensiveness and multidimensional nature of expanding CBRN threats**



Source: Compiled by the authors.

preparedness for CBRN incidents should be in place at ordinary times.

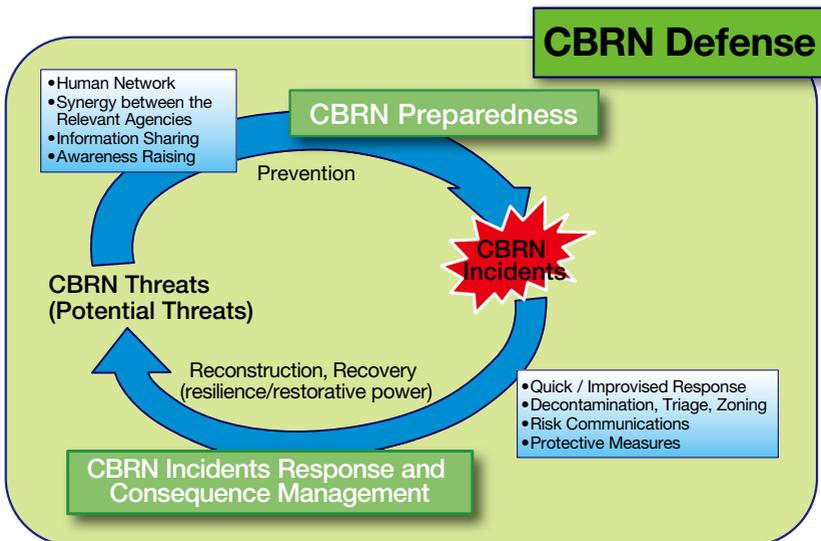
The governance of the concerned sectors for prevention, protection, rapid containment and recovery, and the actions taken in the cycle during ordinary times to the occurrence of a CBRN incident are collectively referred to as CBRN defense in this chapter (Figure 8.2). One of the keys to success in CBRN defense can be outlined as coordination among the relevant entities. Further, CBRN defense not only requires an integrated action of the government domestically, but may also be positioned as nontraditional security that must be dealt with on a global scale because the damage caused by an incident may spread across borders.

## (2) Efforts of CBRN Defense Abroad

This section presents a summary of CBRN defense in the United States, the most advanced country in terms of awareness of CBRN threats, and in the EU, which carries out leading efforts in CBRN defense as a regional organization, based on their respective policy documents.

In the United States in 2002, one year on from the 9/11 terrorist attacks, the

**Figure 8.2. CBRN defense workflow**



Source: Compiled by the authors.

Department of Homeland Security (DHS) was established to control the more than a hundred government agencies involved in homeland security with the aim of being prepared for terrorist attacks in the United States. Also set up was the Directorate of Emergency Preparedness and Response, charged to deal with CBRN terrorism, positioned as a leading agency to handle CBRN incidents together with the relevant state governments, etc.<sup>2)</sup> The role of the Department of Defense (DoD) at the time of the occurrence of a CBRN incident was determined to be the provision of support to government agencies in order for them to maintain capacity to respond incidents.<sup>3)</sup> In the United States, amid growing support for the strengthening of preparedness against the CBRN terrorism, the National Security Strategy 2010 positions the proliferation of nuclear and biological weapons to terrorists as one of the security issues. The Presidential Policy Directive on National Preparedness (PPD-8) issued in March 2011 also deals with emergencies including CBRN incidents in the United States. The directive calls for governmental agencies, private and nonprofit sector organizations and individuals to make contributions to the security and resilience of the nation by sharing responsibility in setting up systematic preparedness.<sup>4)</sup> Based on PPD-8, in September 2011, the DHS and the Federal Emergency Management Agency (FEMA) issued the National Preparedness Goal,<sup>5)</sup> which aims for the country to be safe and resilient by raising the capacity for the prevention of, protection from, minimizing of damage of, and to respond to, natural calamities, terrorist attacks and infectious diseases. Further, it states that a whole-of-community approach is to be adopted so that the whole community bears responsibility during a state of emergency.

The 2010 Quadrennial Defense Review (QDR 2010), published in February 2010, states that the DoD will strengthen its capability to provide appropriate support to civilian bodies in the United States during states of emergency, including CBRN incidents, in response to a request from the DHS, the leading agency, or from the governor of the relevant state.<sup>6)</sup> The QDR 2014 also states that the DoD will continue to strengthen the support system as part of its efforts for the whole-of-community approach in dealing with CBRN threats.<sup>7)</sup> The United States is aiming to raise the capability of the whole country or the entire community in order to respond to emergencies by linking related agencies in the various different levels of the federal government, state governments and local governments in a stratified and integrated manner, through the series of efforts described above.

Concern about terrorist attacks is rising also in the EU because of the 9/11

attacks in the United States in 2001, the 2004 Madrid train bombings in Spain, the July 7, 2005 London bombings, and more recently the risk of acts of terrorism by European returnees from the ISIL, which is expanding in the Middle East. In 2005, the European Union Counter-Terrorism Strategy was devised and, in November 2009, the EU Action Plan on CBRN Security was drawn up to complement the strategy, with a focus on the prevention of CBRN threats and the detection of, preparedness for, and raising the capability to respond to, CBRN incidents.<sup>8)</sup> A new approach for the detection and reduction of CBRN risks was set out in May 2014<sup>9)</sup> based on reports of the implementation of the action plan, clarifying the major fields that are in need of improvements. These are detection capability, the effective use of research, tests and assessments, training, raising awareness, capacity building, and collaboration with countries outside of the EU. The EU is strengthening collaborative relationships with non-EU countries for the handling of CBRN incidents. In 2006, the European Commission set up the Instrument for Stability<sup>10)</sup> to provide effective support at the time of the occurrence of a crisis and to provide support for capability building to non-EU countries to deal with threats of a global scale or that spread across borders. In 2014, the commission set up the Instrument contributing to Stability and Peace<sup>11)</sup>, which is an improved version of the Instrument for Stability, under which the commission conducts international cooperation including cooperation in dealing with CBRN incidents.

US and EU policies concerning CBRN threats demonstrate their views of CBRN threats as being a comprehensive security issue of the country or the union, and as a risk to the health of the citizens, environment and social infrastructures in the country or the region, regardless of whether CBRN threats arise naturally, accidentally, or by criminal acts, including acts of terrorism, or NBC attacks by states. Further, both the United States and the EU attach importance to raising the capability not only of the whole country and the entire community but also of the entire international community to deal with CBRN threats. CBRN threats are serious threats to the citizens and the country, but it is difficult to forecast when, where or for what reason they will arise. In the case of, for example, an accident at a nuclear power plant or an infectious disease outbreak, the damage and the consequences may spread across borders, depending on its scale. The assumption may be made that both the United States and the EU not only are strengthening their capability to respond to CBRN threats in their nation or union but also that they regard CBRN defense as a security issue to be dealt with on a global scale.

## Chemical Weapons in Syria, and Challenges after Destruction

Over fifteen years since the Chemical Weapons Convention (CWC) entered into force, while prohibition of chemical weapons has become the universal norm, chemical weapons have been used in the Syrian Civil War, which began in 2011. The use of chemical weapons in Syria, and the response of the international community to that use brought awareness of chemical weapons anew in 2013 as international security issue. Problems posed by chemical weapons attracted further attention when the Organisation for the Prohibition of Chemical Weapons (OPCW) was awarded the Nobel Peace Prize in 2013.

On August 18, 2013, the United Nations sent a mission to Syria to investigate Syria's alleged use of chemical weapons. On August 21, not long after the investigation began, the use of chemical weapons was reported in several locations, including Ghouta, a suburb of Damascus. The mission swiftly changed the focus of its investigation to Ghouta, and concluded in its report that chemical weapons were used. While the mission report did not make clear who used them, because such verification was not part of its mandate, the US government independently carried out its own investigation, and concluded that the Assad regime used chemical weapons.<sup>12)</sup> Responding to this, although President Barack Obama suggested at one time military attacks on Syria,<sup>13)</sup> it was finally decided to destroy the chemical weapons in Syria under the verification of the OPCW, in the sequence of events shown in Table 8.1.

According to the CWC, the State Party bears the primary responsibility for the destruction of chemical weapons in its territory. However, because Syria was still in the midst of civil war, the decision was made to remove almost all of its chemicals out of Syria for destruction in order to ensure safe and swift destruction. However, the CWC prohibits the transfer of chemical weapons to another country, so the particularly highly toxic chemicals amounting to 600 tons were loaded on a US Navy vessel equipped with Field Deployable Hydrolysis Systems, which neutralizes toxic chemicals, and were destroyed in international waters, outside the territorial waters of any country. Although failing to meet the deadline of the end of June 2014 for the destruction, on August 19, 2014, the Director General of the OPCW, Ahmet Uzumcu, announced that the destruction of the chemical weapons had been completed on the US vessel.<sup>14)</sup>

Although most of the chemical weapons in Syria were destroyed at sea, this does not mean that the problems concerning chemical weapons in Syria have been entirely solved. First of all, the accuracy of the Syrian government's chemical weapon declaration is not known. Chemical weapons in Syria were destroyed based on the declaration made by the Syrian government in accordance with the CWC. However, if any chemical weapons were intentionally concealed by the government or accidentally left out of the declaration, then they will be left behind. At the time of the completion of the destruction at sea, US Secretary of State John Kerry raised the question of possible discrepancy in the declaration of chemical weapons by the Syrian government.<sup>15)</sup> In fact, a discrepancy in a declaration did occur in Libya. After becoming a member of the

**Table 8.1. Timeline of the disposal of chemical weapons in Syria**

August 18, 2013	Dispatch of a UN mission
August 21, 2013	Alleged use of chemical weapons in Ghouta and elsewhere (rebel groups claimed the use of chemical weapons by the Assad regime; 1,300 fatalities reported)
August 27, 2013	The US suggestion of military action
August 30, 2013	US report on chemical weapons in Syria (use by the Assad regime concluded)
September 14, 2013	US and Russian agreement on international control of chemical weapons in Syria
September 14, 2013	Ratification of CWC by Syria (became effective on October 14, 2013)
September 16, 2013	Release of report by UN mission (claims chemical weapons were used but does not identify the perpetrator)
September 27, 2013	OPCW executive council agreement on destruction of chemical weapons in Syria
November 15, 2013	OPCW executive council decision to destroy chemical weapons at sea
December 31, 2013	Deadline for removing chemical weapons out of the country ⇒ Not fulfilled
June 23, 2014	Completion of removing chemical weapons out of the country
July 2, 2014	Transfer of chemical weapons onto the <i>Cape Ray</i> , a US vessel
August 17, 2014	Completion of destruction on the <i>Cape Ray</i>

Source: Compiled by the authors.

CWC in 2004, Libya declared the chemical weapons it held and began to destroy them. In 2011 and 2012, following the collapse of the Gaddafi regime, the new government declared chemical weapons that were not declared in 2004.

Secondly, there is the problem of dual use of chemicals. According to an OPCW Fact Finding Mission report prepared in September 2014, the systematic and repeated use of chlorine gas in the northwest area of Syria was confirmed.<sup>16)</sup> The CWC entirely bans the use of toxic chemicals as weapons; therefore, using chlorine gas as a weapon is a violation of the convention. Responding to the report, US Secretary of State Kerry expressed his view that with the understanding that the attacks were carried out by the Assad regime, the Assad regime should be held to account for its breach of the convention.<sup>17)</sup>

Thirdly, of the chemical weapon production facilities that the Syrian government declared to the OPCW, twelve remain intact.<sup>18)</sup> As the Syrian Civil

War continues to intensify, there is the risk of an extremist militant group obtaining chemical weapons. It has been reported that the ISIL, a militant group of radical Sunni Muslims that increased its power in Iraq and Syria in 2014, is interested in acquiring chemical weapons.<sup>19)</sup> US Ambassador to the UN Samantha Power expressed her concern about the possibility of militant groups obtaining chemical weapons.<sup>20)</sup>

## 2. Current CBRN Concerns

### (1) Chemical Concerns

A noteworthy point at issue concerning chemical threats is the rising concern about the use of chemical weapons in civil wars and in acts of terrorism, and by state authorities against their own citizens to maintain public order and secure political stability. After twenty years on from the Tokyo subway sarin attacks in Japan by Aum Shinrikyo in 1995, the event is being reviewed, particularly by the United States, to elucidate again the facts of the attacks. The Center for a New American Security and a biological and chemical weapons specialist in the United States published new analyses of the sarin attacks, in December 2012 and January 2014, respectively. The reason for this recent interest is considered to be that the possibility of the development of chemical weapons by a terrorist group or other organization is still regarded as being a major threat.

Since the 9/11 terrorist attacks in the United States in 2001, there has been rising concern particularly in the US and Europe that international terrorist groups, such as al-Qaeda, may obtain chemical weapons. Al-Qaeda, led by Osama bin Laden, was assumed as being interested in possessing NBC weapons. The US Central Intelligence Agency reported in May 2003 that al-Qaeda was in the initial stage of production of mustard gas, sarin, and VX at that time.<sup>21)</sup> The US and Iraqi governments accused the Islamic State of Iraq (ISI), a peripheral organization of al-Qaeda, of using chlorine gas in attacks against civilians in Iraq several times in 2007.<sup>22)</sup> The ISIL, which evolved out of the ISI, whose acts of terrorism have been

becoming increasingly violent in Iraq and Syria since 2013, is also reported to have an interest in possessing chemical weapons.<sup>23)</sup>

To prevent proliferation of chemical weapons to terrorist organizations, countries suspected of developing or retaining chemical weapons will have to give up holding them and destroy them under strict international verification. Since the CWC came into effect in 1997, the United States, Russia, India, Albania, South Korea, Libya, Iraq, and Syria have declared their stockpiles of chemical weapons to the OPCW, and either have completed the destruction, or are in the process of destruction, of those chemical weapons under the verification of the OPCW. Among the countries around Japan, North Korea is not a member of the CWC and, according to the South Korean 2012 Defense White Paper, began production of chemical weapons in the 1980s. Estimates of the chemical weapons that North Korea stores in several facilities nationwide range between about 2,500 and 5,000 tons.<sup>24)</sup>

Despite rising concern in the United States and Europe about CBRN terrorism using chemical weapons, this does not seem the case in Japan. One of the reasons for this is thought to be that the defense system against chemical attacks in Japan is relatively robust, because of the strengthening of the capability to respond to chemical attacks by the relevant national agencies, after experiencing the sarin attacks by Aum Shinrikyo. In particular, chemical protection, chemical detection, transportation of casualties, decontamination and medical activities have been boosted, centered on the Chemical Defense Unit of the Ground SDF (JGSDF). Also, for cases for which the SDF are not required, the system of cooperation between the forces and related agencies has been enhanced, including lending suitable chemical protection suits and dispatching liaison personnel from the Chemical Defense Unit.

## **(2) Biological Concerns**

Bio threats may be broadly categorized into three issues. The first of these is the existence of states that are suspected of developing biological weapons, the second is outbreaks of pandemics, and the third is the growing concern of the misuse or abuse of evolving knowledge and technologies in the life sciences.

Concerning the first issue, North Korea has long been suspected of developing biological weapons, and this suspicion has not been eliminated. South Korea's 2012 Defense White Paper points out that North Korea has the capability to

produce variety of biological weapons including anthrax, smallpox and pest.<sup>25)</sup> Also, Bruce Bennett, senior defense analyst of RAND Corporation in the United States, stated at the Senate Committee on Armed Services in 2013 that preparedness should be in place to counter the threat of North Korea's biological weapons.<sup>26)</sup> Awareness of the threats mentioned above has prompted the United States and South Korea to carry out joint defense exercises for biological warfare, called Able Response, every year since 2011.<sup>27)</sup> A particular feature of this exercise is the participation of a wide range of related agencies that include the departments of defense, the departments of health, and disease control centers of both the United States and South Korea, and the Federal Bureau of Investigation (FBI), the DHS and the FEMA from the United States,<sup>28)</sup> demonstrating that the two countries treat biological threats very seriously.

The United States and South Korea are raising the level of preparedness against biological weapons because of the threat of attacks using such weapons by North Korea, and also to raise the ability to deal with infectious diseases, which is categorized as the second issue. There is the possibility that pathogenic bacteria that North Korea is suspected of cultivating, or naturally generated deadly pathogenic bacteria, may enter South Korea accidentally, so there is the need to be able to detect and to confine these organisms swiftly. Not only in the Korean Peninsula but also in the United States, the consequences of epidemics of deadly infectious diseases are of high concern as a security issue. An epidemic causes direct harm to people, animals, and plants, and as a consequence causes significant damage to society and the economy. The 2001 anthrax attacks in the United States, which occurred soon after the 9/11 terrorist attacks, caused panic across the country as people suspected terrorist attacks, and the cost of decontamination of the Senate office building and Postal Service buildings reached approximately \$300 million.

The United States puts significant efforts into raising the capability of handling biological threats, because once a biological threat occurs, it will cause tremendous damage. The National Security Council (NSC) made its first issuance of the National Strategy for Countering Biological Threats<sup>29)</sup> in November 2009. The national strategy recognizes the necessity to raise prevention capability through cooperation between diverse related agencies and individuals both in the country and abroad, and states that biological threats are a security issue that should be dealt with globally. In February 2014, the United States set up the Global Health

Security Agenda (GHSA), and measures against biological threats in the public health sector and the security sector have been institutionalized further. The DoD provides support to the GHSA for actions taken for protection against threats, threat reduction and bio defense, nationally and internationally.<sup>30)</sup> In September 2014, President Obama stated that Ebola virus disease, which raged in West Africa in that year, was a priority issue of national security, and announced the provision of facilities to treat the disease and the decision to send US armed forces.<sup>31)</sup> In October 2014, Japan, too, dispatched liaison personnel to the headquarters of the United States Africa Command in Germany<sup>32)</sup>, and delivered personal protection equipments to West Africa, using Air SDF aircraft.

The third issue is related to dual use research of concerns, which is life sciences research that is intended for benefit, but which might easily be misapplied to do harm, accompanied with the rapid scientific and technological advances in the life sciences and it has been rising in recent years. Creation of viruses that do not exist has become possible only with genetic information due to recent rapid advances in synthetic biology and other fields. Considering the risk of the misuse and abuse of such knowledge and technologies for biological weapons, the US national strategy mentioned above points out the necessity of creating norms of safe and responsible use of the life sciences, and of institutionalizing a system that is effective in reducing the risk of using life science inappropriately.<sup>33)</sup>

In 2001, Japan's Defense Agency (as it was then called) published a report by the Panel on Biological Weapons Countermeasures,<sup>34)</sup> which defined biological threats as including acts of terrorism and threats arising from the advance of scientific technologies, such as threats using genetic engineering. The report stated that the Defense Agency and the SDF must become capable of handling such threats and that, at the same time, the entire government needs to take actions against the threats, including improving measures to cope with infectious diseases. In March 2008, the NBC Countermeasure Medical Unit, under the direct control of the Minister of Defense, was set up in the JGSDF, to minimize the damage that biological weapons would cause. With the aim of preventing inappropriate use of scientific technologies, the National Defense Medical College in conjunction with the University of Bradford in the United Kingdom, developed an education module for scientists. In 2008, the National Defense Academy of Japan launched a biosecurity education program.

### **(3) Nuclear and Radiological Concerns**

Concerning nuclear and radiological threats, in a 2009 speech in Prague, US President Obama<sup>35)</sup> said nuclear terrorism was a threat to national security that should be dealt with most urgently, and the same point was made in the 2010 Nuclear Posture Review Report.<sup>36)</sup> Acts of nuclear terrorism can be broadly separated into the following four categories: (1) theft and detonation of nuclear weapons, (2) production and use of improvised nuclear explosive devices (INDs) for which a stolen nuclear weapon is used, or that are designed to reach criticality by using a fissile material, (3) the interference and destruction of nuclear power plants and other nuclear facilities, and (4) use of RDDs that are designed to cause contamination through the dispersal of radioactive substances by using explosives, without any fissile material reaching criticality.<sup>37)</sup>

From the aspects of destructive and killing power, it is obvious that there is a difference in the security impact and damage intensity between the use of a nuclear weapon or an IND and a terrorist attack on a nuclear facility, such as a nuclear power plant, or the use of an RDD by terrorists in an urban area. Disregarding the probability of occurrence, nuclear weapons and INDs have the highest destructive power. With regard to the security environment in Northeast Asia, where Japan is located, North Korea poses a nuclear threat, and Russia and China are both nuclear weapon states that are modernizing their nuclear forces. Therefore, it can be said that the proliferation of nuclear weapons, which belongs to the traditional security sphere, still comprises a part of CBRN threats. To cope with these threats, in addition to multilateral actions, strengthening of international norms for nuclear disarmament, nuclear nonproliferation, and export control, implementation of confidence building measures and maintaining a reliable deterrence are vitally important. Building upon these efforts, in cases of realization of a threat, CBRN defense is expected to significantly contribute to minimizing the damage.

The Fukushima Daiichi nuclear power plant disaster revealed the vulnerability of nuclear power plants and other nuclear facilities to terrorist attacks, namely the loss of the entire power source, which aroused international attention.<sup>38)</sup> It should be noted that taking into consideration the bombings of nuclear facilities in Iraq and Syria by Israel, depending on regional security environment and the level of nuclear proliferation, armed attack situations on nuclear power plants and other nuclear facilities should be recognized as being a threat. Compared with attacks

using nuclear weapons or INDs, both the number of fatalities and the extent of the physical damage caused directly by the bombings are naturally assumed to be less. Terrorist attacks and armed attack situations on nuclear power plants are serious CBRN threats comprehensively considering the economic and social loss, the psychological effects and the medium- and long-term radiation exposure threats. Physical protection of nuclear materials and nuclear security are critical measures to reduce such threats. The Nuclear Security Summit, held every other year since 2010, makes a significant contribution to raising the standard of nuclear terrorism measures in the international community. The Nuclear Security Summit held in The Hague, the Netherlands, in March 2014, Japan emphasized comprehensive and advanced actions, including responses to internal threats and transportation safety, and was highly acclaimed by overseas research institutions and other organizations.<sup>39)</sup> There are no tangible goals for these actions, but making continuous efforts is important to raise global nuclear security, based on the responsibility of states.

With regard to radiological threats, warnings have been received for some time now about threats of use in acts of terrorism of RDDs,<sup>40)</sup> which are produced by attaching radioactive substances to explosive devices. These radioactive substances prepared for medical or industrial applications are relatively easy to obtain and include cobalt-60, strontium-90, cesium-137, iridium-192, polonium-210, americium-241, and californium-252. CBRN incidents caused by radioactive substances that have occurred so far are limited; examples are the case in which a Chechen group put cesium-137 in a park in Moscow in 1995, and the case in which Alexander Valterovich Litvinenko, a former Russian spy, was killed by polonium-210 in London in 2006. There has been no confirmed attack using an explosive RDD.

Considering the number of fatalities, RDD attacks or acts of terrorism using radioactive substances are much less intense than other cases of nuclear terrorism. Reviewing the Fukushima Daiichi nuclear power plant disaster, however, the psychological impact caused by the dispersion of, and contamination by, radioactive substances in the environment is significant in the community, and cannot be ignored. It is needless to say that prevention and containment of incidents in which RDDs are used are important. However, if such an incident occurs, then risk communication in order for relevant organizations to share accurate information and to have mutual understanding will be crucial. The

challenge is the way to maintain such risk communication mechanism among the relevant agencies, not only at the time of nuclear and radiological incidents, but in continuity with the ordinary time.

To respond to nuclear and radiological threats, appropriate radiation protection is necessary. For this reason, the SDF has prepared protective masks and protection suits to prevent internal exposure, and there are plans for the SDF, in cooperation with related agencies, to measure the state of contamination and to transfer casualties, assuming the activities of the Chemical Defense Units of the SDF, which are equipped with chemical reconnaissance vehicles with a certain level of radiation shield capacity.<sup>41)</sup>

### **3. CBRN Defense in Japan and Prospects**

#### **(1) The Current State of Japan's Domestic Framework for CBRN Defense**

CBRN defense involves various domestic sectors, as it does internationally, and thus, gaining an overall understanding of CBRN defense requires multidimensional viewpoints, as stated earlier. Among those viewpoints, the aspects of public order, disaster prevention, and defense and security are the core of CBRN defense. With regard to the aspect of public order, constant efforts be made to prevent crimes (prevention); and in case of a large scale event planned or a crime notice was announced, then preparations be made for possible CBRN terrorism; and if an act of CBRN terrorism should occur, then the police search for and arrest the criminals. Although these steps may differ by country because of differences in the institutional culture, this is a general cycle of CBRN defense. Concerning the aspect of disaster prevention, important steps are prevention and preparedness for disasters (prevention), and in the case of disasters, the implementation of disaster measures centering on the relevant local governments, the fire service, hospitals, and other such agencies (protection and containment at an early stage), and recovery from the damage caused by the disaster (reconstruction and recovery). With regard to the aspect of defense and security, CBRN threats should be identified and monitored in ordinary times, and CBRN incidents should be prevented by establishing and maintaining a reliable deterrence (prevention), and at the same time preparedness for the incidents should be in place. If a CBRN incident occurs and is a threat to defense or exceeds the capacity of the police, then the armed

forces (in Japan, the SDF) should handle the incident. As described above, CBRN defense is generally resolved as the domestic governance of the relevant sectors, and the cycle is comprised of prevention and protection, containment at an early stage and recovery, which was illustrated in Figure 8.2 above.

Turning to Japan's domestic framework particularly relevant to CBRN defense, it is essentially based on three laws relating to crisis management: the Basic Act on Disaster Control Measures (enacted in 1961), the Act on Special Measures Concerning Nuclear Emergency Preparedness (1999), and the Civil Protection Law (Law Concerning Measures for Protection of the People in Armed Attack Situations etc; 2004).

The occurrence of CBRN incidents including the sarin attacks by Aum Shinrikyo in 1994 and 1995 as well as the 9/11 terrorist attacks and subsequent anthrax mail attacks in the United States in 2001 triggered to accelerate the formation of the CBRN defense framework in Japan. The enactment of the Civil Protection Law in 2004 represented a watershed in the evolution of CBRN defense by defining the scope of armed attack and emergency response situations, and specifying the responsibilities of local governments in those situations. The Civil Protection Plan, which is made in accordance with the Civil Protection Law, is expected to be improved to ensure that the plan functions effectively, through cooperation and collaboration among government agencies, local governments, enterprises and volunteers, which is greatly hoped for, also from the aspect of strengthening the basis of Japanese CBRN defense. In fact, practical and theoretical training for civil protection by local governments and the Cabinet Secretariat is held at various locations in Japan every year, and by using diverse scenarios, participating entities check each other's initial response and strengthen their cooperative relationship. Under these circumstances, it has been noted that although increasing number of local governments are trying to be able to collect damage information and have an understanding of the state of handling of a disaster as preparedness for a crisis, few have standardized these.<sup>42)</sup> The relevant ministries, agencies, and experts are deliberating upon whether or not implementation of the Incident Command System, a centralized crisis management system developed in the United States, modified to suit Japanese systems, is appropriate.

The Ministry of Defense has also formulated its own Civil Protection Plan that, among other things, maps out action plans for responding to the destruction of petrochemical complexes or nuclear power stations, mass dispersal of biological

**Table 8.2. Major improvements in the basis of CBRN defense in Japan**

	Act on the Prohibition of Chemical Weapons and the Regulation of Specific Chemicals (1995)
	Act on Prevention of Bodily Harm by Sarin and Similar Substances (1995)
	National Defense Program Guidelines for FY1996 and beyond (1995)
	Establishment of the position of Deputy Chief Cabinet Secretary for Crisis Management (1998)
1995-1999	Initial Government Measures against Serious Acts of Terrorism, etc. (1998)
	Cabinet Secretariat Initial Response Manual (1998)
	Measures against Acts of Terrorism Aiming for Mass Casualties (1999)
	Medium Term Defense Program (1999)
	Act on Special Measures concerning Nuclear Emergency Preparedness (1999)
	Measures against NBC Terrorism and other Acts of Terrorism Aiming for Mass Casualties (2001)
	Basic Government Policy concerning Biological and Chemical Terrorism (2001)
	Model of Cooperation of Local Organizations in Handling NBC Terrorism (2001)
	Amendment of the Infectious Diseases Control Act (2003)
2000-2004	Details of the Initial Government Response for States of Emergency (2003)
	Guidelines for Measures against Smallpox (2004)
	Armed Attack Situations Response Act (2003)
	Action Plan for Prevention of Acts of Terrorism (2004)
	Civil Protection Law (2004)
	Basic Policy for Civil Protection (2005)
2005-2009	2008 Action Plan for Materialization of a Community with Strong Resistance to Crime (2008)
	Government Measures against Avian Influenza (2010)
	Strengthening of Measures for the Prevention of Acts of Terrorism on Nuclear Power Plants, etc. (2011)
2010 to the present	Basic Plan for Disaster Prevention (2012)
	Basic Act for National Resilience (2013)
	Basic Plan for National Resilience (2014)

Source: Compiled by the authors.

agents, and other specific contingencies in various contexts such as cases caused by attacks using NBC weapons and armed attack on nuclear power plant, responses to armed attack disasters, and responses to emergency response situations.<sup>43)</sup> The SDF have been dispatched to deal with nuclear and other disasters<sup>44)</sup> as provided for by the Self-Defense Forces Act, so they have experienced numerous CBRN incidents and have accumulated knowledge of how to deal with them.

CBRN incidents in which the SDF participated in handling in recent years include the Tokaimura nuclear accident in Ibaraki Prefecture in September 1999, responding to an epidemic of avian influenza in 2004, and also to an epidemic of foot-and-mouth disease on livestock in 2010, for which the forces were sent to assist with disaster relief operations. The SDF carry out a wide range of other preventive operations, such as operations at important government events, including the G8 Toyako Summit held in Hokkaido in July 2008, and the APEC Economic Leaders' Meeting in November 2010. The SDF have internationally valuable experience in, and have learned lessons about, CBRN defense acquired from their operations beginning from the sarin attacks by Aum Shinrikyo of twenty years ago to the Fukushima Daiichi nuclear power plant disaster.

The organizational capability of the SDF in their handling of CBRN incidents is also being enhanced. For example, NBC Protection Units and Chemical Defense Units are located and strengthened at JGSDF camps nationwide. Seventeen of these units are located throughout the country in the following camps: the JGSDF Northern Army's Camp Asahikawa in the 2nd Division, Camp Obihiro in the 5th Brigade, Camp Higashichitose in the 7th Division and Camp Makomanai in the 11th Brigade; the JGSDF North Eastern Army's Camp Aomori in the 9th Division and Camp Jinmachi in the 6th Division; the JGSDF Eastern Army's Camp Somagahara in the 12th Brigade, the JGSDF Chemical School at Omiya, Central NBC Protection Unit and Camp Nerima in the 1st Division; the JGSDF Middle Army's Camp Moriyama in the 10th Division, Camp Senzo in the 3rd Division, Camp Kaitaichi in the 13th Brigade and Camp Zentsuji in the 14th Brigade; and the JGSDF Western Army's Camp Fukuoka in the 4th Division, Camp Kitakumamoto in the 8th Division and Camp Naha in the 15th Brigade. The units are staffed by approximately 950 people,<sup>45)</sup> and most are close to the major relevant facilities such as nuclear power plants and extensive chemical-related industrial facilities. These units are responsible for dealing with CBRN incidents<sup>46)</sup> in collaboration with the NBC Countermeasure Medical Unit and the

Bomb Disposal Unit.

In cases where the SDF deal with CBRN incidents in defense operations and public security operations, or containment of damage caused by HAZMATs during disaster relief operations, for the protection of citizens, mainly the Chemical Defense Unit of the JGSDF and the medical units of each branch of the SDF will provide support to the relevant agencies in various ways. Additionally, the Central NBC Protection Unit, positioned under the Central Readiness Force, is expected to deal with CBRN incidents, and provide support for such incidents, nationwide. Also, the JMSDF and the JASDF are devising measures such as maintaining defense equipment and materials on vessels and bases.<sup>47)</sup>

Concerning equipment and technologies, the Technical Research and Development Institute of the Ministry of Defense and the JGSDF are developing and procuring personnel protection equipment and detection technologies. In recent years, in addition to the long-going research into NBC hazards, research into CBRN technologies is becoming prominent, and includes research into remote-controlled small reconnaissance vehicle systems and into CBRN Threat Assessment Systems. Also, development of equipment to be used directly in CBRN defense, such as a new system for decontamination of people, equipment, and areas that have been contaminated by radioactive substances, biological agents, or toxic chemicals, is being actively performed. Equipment for chemical agent surveillance, medical countermeasures for biological agents, new system for biological agent detection, NBC reconnaissance vehicles, biological reconnaissance vehicles, and other equipment are being procured and brought into use to raise the capability to detect and identify NBC weapons and as preparedness

for the handling of NBC incidents (CBRN incidents) subsequent to ballistic missile impacts.<sup>48)</sup> These development and procurement meet the requirements at disaster sites, taking into considering lessons learned from the Great East Japan Earthquake and the Fukushima Daiichi nuclear power plant disaster in 2011.<sup>49)</sup> The quality of the equipment stands in comparison



**Remote-controlled small reconnaissance vehicle system** (Japan Ministry of Defense)

with CBRN defense equipment developed by overseas defense industries, and the fact that high technology standards are being aimed for should be favorably assessed. On the other hand, problems remain concerning the sufficiency of CBRN equipment at the units.

## **(2) Bilateral/Multilateral CBRN Defense Cooperation and Coordination**

There are indications that cooperation and coordination between national governments for CBRN defense, which is considered as a new security agenda, have been advancing in recent years. Japan is no exception, and together with the United States, issued a joint statement after the Security Consultative Committee (2+2) meeting in 2005, and the CBRN Defense Working Group (CDWG) that was set up based on the 2006 joint 2+2 statement deliberates upon issues related to CBRN weapons, including decontamination, disposal, protection, and damage handling, from diverse aspects such as government policies, operations, and research and development.<sup>50)</sup> Concerning the CDWG, the 2007 joint 2+2 statement includes: “to make steady progress in improving readiness and interoperability of US and Japanese forces against CBRN weapons, ensuring sustained operational capability in the event of an attack by weapons of mass destruction.”<sup>51)</sup> This demonstrates the strong intention to raise the capacity of the SDF and the US forces, considering armed attack situations between states using NBC weapons, which have been a point of concern since the time of the Cold War, as well as the new security issue of CBRN terrorism, in changes in the international security environment during the time from the 9/11 terrorist attacks in the United States in 2001 to the nuclear testing conducted by North Korea in October 2006. The 2011 joint 2+2 statement, Cooperation in Response to the Great East Japan Earthquake—announced in June 2011 soon after Operation Tomodachi, which was carried out for the Great East Japan Earthquake—notes: “The bilateral response to the Fukushima Daiichi Nuclear Power Plant incident demonstrated the importance of strengthening the Chemical, Biological, Radiological, and Nuclear (CBRN) Defense Working Group as a venue for policy coordination and cooperation in such areas as information sharing, protection, decontamination, and consequence management.”<sup>52)</sup> It can be understood that following the Great East Japan Earthquake, the role expected of the CDWG has clearly changed and has begun to include diverse states of emergency (the all hazards approach), including CBRN

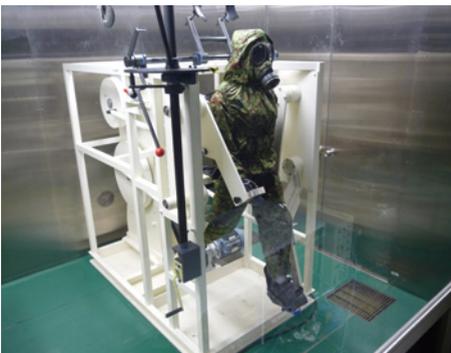
incidents, such as large HAZMAT spills in an incident or a disaster. The new cooperation initiative, mainly focusing on CBRN threats, between Japan and the United States is advancing also in practice. An example is the July 2013 joint exercise between the JGSDF and the US Marines CBRN Unit<sup>53)</sup> at Camp Courtney in Okinawa, which is a laudable result of policy coordination by the CDWG.

Japan is also looking to cooperate with other partners as well. In June 2013, Japan and the United Kingdom agreed to carry out joint research into a method to evaluate the performance of chemical protection suits.<sup>54)</sup> This agreement attracted extensive attention as a bilateral development of defense equipment, but from the aspect of CBRN defense, the agreement may be positioned as technological cooperation for the protection of personnel.

Regarding cooperation with regions, in May 2011, Japan and the EU agreed on cooperation aiming to ease tensions arising from CBRN incidents in third countries. Exchange of information began<sup>55)</sup> mainly for the goal of raising the capability to handle nuclear and radiological incidents, in particular. A statement issued following the Japan-EU Summit in November 2013 noted that the leaders were pleased with the progress made in cooperation to reduce the risks of CBRN terrorism.<sup>56)</sup> Japan and NATO also cooperate. The Japan-NATO Joint Political Declaration in April 2013 stated that areas for which talks and cooperation were possible included disaster relief, measures against acts of terrorism, non proliferation of WMDs and their means of delivery,<sup>57)</sup> all of which may be considered to be peripheral fields of CBRN defense. At the Japan-NATO Symposium in Tokyo in June 2013, CBRN incidents were included in matters for

cooperation between Japan and NATO for discussion.<sup>58)</sup> Discussion with both the EU and NATO for cooperation in CBRN defense has just started. Basically, the all hazards approach will be sought, beginning with an understanding of each other's approach to CBRN defense.

Japan, Mexico, the United States, the United Kingdom, Canada, France, Germany, Italy, and the European Commission participate



**Chemical protection suit performance evaluation at Technical Research and Development Institute (Japan Ministry of Defense)**

in the Global Health Security Initiative (GHSI),<sup>59)</sup> which is a multilateral cooperation scheme aiming to strengthen the capability to deal with public health. The initiative is attracting attention as a vehicle for multilateral cooperation for CBRN defense. One of functions of the GHSI has been the building of a network for CBRN defense specialists in various states since its establishment in 2001. From 2012, the GHSI included CBRN threats and their continuous assessment as subjects for discussion.<sup>60)</sup> The scope of the activities of the GHSI may further expand, beyond the fields of public health and biological threats.

Examples of Japan's bilateral and multilateral collaboration initiatives mentioned above amply show the comprehensiveness and multidimensional nature of CBRN defense, which covers diverse threats, including armed attack situations using NBC weapons, acts of terrorism, diseases, natural disasters and accidents. These threats cross over traditional and nontraditional security challenges, which considerably expand the scope of bilateral or multilateral cooperation. This, in other angle, means that the CBRN defense widens the possibility to cooperate with broader range of existing specialized fields including the nonproliferation of WMDs, disaster prevention, public health, and counterterrorism measures, which go beyond traditional field of defense and security, as required. In the light of this, CBRN defense can be a new vehicle for international cooperation, and at the same time an aim to be achieved.

Today, CBRN threats have become implicit or explicit concerns to many countries. There is also the possibility that CBRN damage spreads across borders to other states, depending on the development path of the incident. However, CBRN defense is primarily a matter of domestic governance, and coordination and synergy among the relevant domestic agencies in various sectors are prerequisites. To this end, in different organizational cultures, there are many items that require prior coordination, including standard procedures to deal with CBRN incidents, interoperability of equipment, and the language of common use. If it becomes interstate cooperation, there are even more matters to be coordinated for materialization of effective CBRN defense.

Nonetheless, Japan has already experienced, and dealt with, many of the elements that comprise CBRN threats in the country. We believe that it is highly likely that Japan, with its experience and knowledge, will make a significant contribution to the investigation of best practices in the handling of CBRN incidents with bilateral or multilateral cooperation.

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(Sukeyuki Ichimasa, Shuji Sue, Kiwako Tanaka)

