Guidelines for the Initiation of Humanitarian Assistance under Nuclear Disaster Conditions

To guide organizations and supporters in delivering assistance rooted in the rights and needs of disaster survivors

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Compiled by Japan Platform

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Introduction

Immediately after the Great East Japan Earthquake, which occurred at 2:46 p.m. on March 11, 2011 (hereinafter referred to as '3.11'), government-affiliated organizations began conducting rescue and relief operations. At the same time, numerous NGOs engaged primarily in international cooperation and NPOs focused on addressing local issues within Japan started preparing to initiate assistance in the three affected prefectures—Iwate, Miyagi, and Fukushima—including deliberations on whether or not to commence such operations. Faced with an unprecedented, wide-ranging disaster, Fukushima Prefecture stood out for its size and location. It is almost twice as large as Miyagi, the prefecture closest to the earthquake's epicenter, and also the nearest of the three affected prefectures to the Tokyo metropolitan area, which under normal circumstances would have made it relatively easy for relief workers to reach. However, when the tsunami that followed the earthquake triggered an accident at the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Plant (hereafter "Fukushima Daiichi"), it created a crisis that no one had anticipated. Government agencies and private organizations alike lacked the information and preparedness to respond, and faced with survivors in urgent need, aid groups struggled over policies and implementation, leading to confusion and hesitation.

For example, the Japanese Red Cross Society (hereafter "Japanese Red Cross"), the country's largest and most specialized humanitarian relief organization, mobilized immediately on that day. A total of 55 medical relief teams made up of doctors, nurses, and other personnel were dispatched from across Japan to the three affected prefectures, and among them, 13 teams—94 people in all[1]—began operations in Fukushima. At Fukushima Daiichi, the tsunami knocked out all power and caused meltdowns in three reactors, and on the afternoon of the 12th a hydrogen explosion occurred in the Unit 1 reactor building; since the Japanese Red Cross relief teams had no protection against radiation, the Fukushima Prefectural Chapter decided on the 13th to withdraw the external teams from the prefecture for temporarily.

On March 19, radiation specialists from the International Committee of the Red Cross (ICRC) arrived in Japan, donating 80 portable dosimeters and advising the Japanese Red Cross on its future response plans. From March 23 to 25, emergency radiation medicine advisers from the Red Cross hospitals in Hiroshima and Nagasaki began working on site in Fukushima. As internal resources such as dosimeters, protective suits, medicines, and training systems were gradually put in place,[2] the Japanese Red Cross resumed its activities in Fukushima outside the 30-kilometer zone from the nuclear plant, following notices issued on March 19 and March 22, and under carefully considered safety measures.

Even an organization as large as the Japanese Red Cross, with nearly 70,000 staff and membership in a global network known for its high level of expertise, had no preparations for a nuclear disaster. As a result, its initial activities in Fukushima were marked by confusion. Notably, the directive issued shortly after the accident, which limited activities to areas beyond a 30 km radius, was revised on June 6 to extend the permissible area to those beyond 20 km. Citizen groups, including NPOs and NGOs, experienced similar confusion, and in some cases even greater hesitation in starting their relief efforts. As a result, the level of support directed to Fukushima was lower than in the other two prefectures. According to a survey by the Japan NGO Center for International Cooperation (hereafter "JANIC"), the largest NGO network in the country, 59 organizations carried out relief activities across 100 locations in the three affected prefectures. Of these, only 17 percent were in Fukushima[3].

One of the key roles in disaster relief in Japan is played by volunteers, whether individuals or groups. They help clean up damaged homes and respond to the various needs of disaster survivors. In the municipalities affected by 3.11, the local Social Welfare Councils (hereafter "SWCs") established Disaster Volunteer Centers (hereafter "VCs"). These centers served as hubs for organizing and coordinating volunteer activities.

Once the systems for receiving them were in place, volunteers rushed in from all over the country. By the end of December 2011, the total number across the three afflicted prefectures had reached 957,830.[4] As shown in Table 1, the impact of the nuclear disaster is clearly reflected in the number of VCs and volunteers. The number of volunteers per prefecture peaked at 38.8% at the end of 2011, yet only 15.0% went to Fukushima Prefecture, even though it accounts for 35.5% of the population of the three disaster-stricken prefectures. Although the extent and nature of the damage varied among them, it is clear that far fewer volunteers came to Fukushima.

[1] Japanese Red Cross Society, The Great East Japan Earthquake Disaster: A Complete Record from Relief Activities to Recovery Support, pp. 42–43, 2013.

[2] Japanese Red Cross Society, The Great East Japan Earthquake Disaster: A Complete Record from Relief Activities to Recovery Support, pp. 121–191, 2013.

[3] Japan NGO Center for International Cooperation (JANIC), The Great East Japan Earthquake Disaster: Report on the Joint Review of Support Activities by Civil Society – From the Perspective of International Cooperation NGOs, p.54, 2014.

[4] National Council of Social Welfare, "12 Years after the Great East Japan Earthquake Disaster," https://www.saigaivc.com/earthquake/311/ (accessed January 26, 2025).

Table 1. Volunteer Centers, Number of Volunteers (end of 2011), and Population (October 2010) in the Three Disaster-Stricken Prefectures

	Volunteer Center		Volunteer		Population	
	Number	Ratio (%)	Number	Ratio (%)	Number (thousands)	Ratio (%)
Fukushima Prefecture	**40**	**38.8**	**143,792**	**15.0**	**2,029**	**35.5**
Miyagi Prefecture	37	35.9	494,015	51.6	2,348	41.1
Iwate Prefecture	26	25.2	320,023	33.4	1,331	23.3
Total	103	100	957,830	100	5,708	100
Source	Date: As of November 3, 2011 Source: Cabinet Office, Government of Japan, Disaster Management (2011)		Date: As of the end of November 2011 Source: Japan National Council of Social Welfare (2018)		Date: As of October 1, 2010 Source: Statistics Bureau of Japan (2011)	

Compiled by the author

As of January 2024, there are 595[5] nuclear power–related facilities in 38 countries, including Japan. Although safety measures at nuclear power plants in Japan and elsewhere have been strengthened since 3.11, the possibility of disasters beyond human foresight or planning always exists, and situations may arise in which residents of surrounding areas are forced to evacuate; for this reason, it is important for aid organizations and their workers to prepare policies and systems for responding to nuclear disasters, just as they do for natural disasters.

◎Purpose/Objective

This guide is intended to ensure that, in the event of a nuclear disaster, humanitarian organizations such as NPOs and NGOs in Japan and abroad provide relief to survivors and evacuees in a way that respects their dignity and rights. It also aims to help these organizations establish safety measures in advance for the staff they dispatch, so that relief activities can be carried out while mitigating certain risks.

◎Intended Audience

This guide has been prepared mainly for humanitarian organizations such as NPOs and NGOs in Japan and abroad, and for the relief organizations and workers within them who may be involved in supporting survivors and evacuees in the event of a nuclear disaster. It is also our hope that local governments hosting nuclear power plants, as well as public institutions, residents, and the media—who would all be directly involved if such an event were to occur—will take an interest in the guide as part of their own preparedness.

◎Process and Methodology

Japan Platform (hereafter "JPF"), the issuing organization, together with its member NPOs and NGOs, has been providing support to affected people and communities since 3.11 and the Fukushima Daiichi nuclear accident. In 2022, JPF decided to develop this guide for aid organizations and their workers, with the aim of helping them review and prepare policies and systems for nuclear disaster response, drawing on the knowledge gained from more than ten years of support activities.

For this project, the "Executive Committee for Developing a Humanitarian Assistance Guide under Nuclear Disaster" (hereafter "the Executive Committee") was formed, bringing together NPOs, NGOs, and experts involved in Fukushima support. Over a period of two years, the guide was compiled through committee meetings and small working groups, with contributions from committee members and advice from outside specialists.

[5] Japan Atomic Industrial Forum, Inc. (JAIF). World Nuclear Power Development Status as of January 1, 2024. https://www.jaif.or.jp/cms_admin/wp-content/themes/jaif_new/assets/wnpp/pdf/2024-reference01.pdf Accessed November 29, 2024.

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(listed in Japanese alphabetical order; *Chair, **Vice-Chair. Titles as of the time of writing)

Hiroko Aihara	– Journalist based in Fukushima**
Kazuhiko Amano	– Specially Appointed Professor, Fukushima University / Representative Director, Fukushima Collaboration and Recovery Center**
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Sayako Nogiwa	– Manager and Advocacy Manager, Support Program Department, Association for Aid and Relief, Japan (AAR Japan)
Tsutomu Yamanaka	– Former On-site Coordinator, Fukushima Collaboration and Recovery Center

In writing and reviewing Part II, we used the Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response[6]—the most widely referenced standard among humanitarian organizations and workers worldwide—as a comprehensive and qualitative standard grounded in the rights of disaster-affected people to live with dignity. Based on this handbook, we organized the content as shown in Table 2, presenting both the desired outcomes of support and the corresponding actions needed to achieve them.

In Part II, the chapters are organized in chronological order of preparedness, beginning with topics related to evacuation (such as the mobilization of supporters and volunteers, evacuation assistance, shelter management, and community support) and concluding with the essential perspective of supporting people with specific needs.

Efforts were also made to ensure that the content would be accessible to support organizations and workers in other countries and regions with nuclear power plants or related facilities.

Table 2. Structure of Chapters in Part II: Guidance for Initiating Assistance in the Event of a Nuclear Disaster

1	Chapter Title	A “signpost” providing an overview and flow of the chapter’s content
2	Rationale	An explanation of what aid organizations and workers must understand and respond to in the event of a nuclear disaster.
3	Minimum Standards	Delineates, in qualitative terms, the desired state of aid as a universal recommendation
4	Fundamental Actions	Delineates the practical steps needed to meet the minimum standards.
5	Guidance Note: Lessons from the Experience of Aid in Fukushima Prefecture	Adds Fukushima-based insights and cases to reinforce fundamental actions.

◎Notes for Readers of This Guide

This guide is the first compiled specifically for aid organizations and their workers, based on experiences of implementing support activities in Fukushima from the time of the 3.11 disaster to the present. Consequently, the “Guidance Notes,” which provide additional information for putting the minimum standards into practice, are grounded in the social context and characteristics of aid in Fukushima Prefecture and Japan. They may therefore not fully apply in future nuclear disasters or in other countries and regions with different social structures.

In addition, the contents of this guide have been compiled based on the knowledge of the Project’s Executive Committee and confirmed by the publisher. It should be noted that the guide does not include detailed analysis or reference to past nuclear power plant accidents or disasters, nor to the challenges and responses observed in those cases around the world.

Executive Committee Chair
Masaaki Ohashi

[6] Sphere, The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response, Japanese Edition, 4th ed., 2019.

Glossary of Terms

The following definitions are used in this guide.

EpiPen:
An auto-injector containing adrenaline (epinephrine) used to relieve symptoms of anaphylaxis, a severe allergic reaction.

Severe accident:
An accident at a nuclear facility such as a nuclear power plant that goes beyond the scope anticipated in design safety evaluations, causing the reactor core temperature to rise, leading to core meltdown or damage to the containment vessel.

Disaster-related death:
Death caused by the worsening of injuries sustained in a disaster, or by a decline in health due to the physical or psychological burdens of evacuation life such as prolonged displacement or stress.

SPEEDI (System for Prediction of Environmental Emergency Dose Information):
A system in Japan designed to rapidly predict and calculate, using computer models, the impact on surrounding areas in the event of an accident at a nuclear power facility where the release of radioactive materials into the atmosphere is anticipated. The purpose is to provide information quickly to support the planning and implementation of evacuation measures. Similar systems are independently maintained in other countries, such as the United States and various European nations.

Supporters and Volunteers:
“Supporters” refers to NGOs, NPOs, volunteer organizations, local governments, public bodies, or private companies that commit to assisting affected communities of large-scale and wide-area nuclear disasters, through staff who work on-site either continuously or on a regular basis.
“Volunteers” refers to individuals who, through such organizations, or by registering directly with volunteer centers set up and operated by local municipalities in the disaster-affected areas, engage in volunteer activities to support those affected.

Dual-location living:
A situation in which the primary earner and their family live separately. In many cases, to secure an economic base, the earner remains in the original community despite certain risks, while the rest of the family evacuates to avoid those risks. They maintain two separate places of residence, moving back and forth between them as part of their lifestyle.

Human security:
A concept of security that emphasizes the protection of each individual’s well-being. First articulated in the 1994 Human Development Report of the United Nations Development Programme (UNDP), it shifts the focus away from “national security” centered on military threats and defense, toward ensuring people’s safety from threats such as poverty, conflict, infectious disease, disasters, and environmental degradation. Human security seeks to respond to both existing and emerging cross-cutting threats, with the aim of safeguarding people’s survival, livelihoods, and dignity.
(Source: UNDP Human Development Report 1994)

Terms related to “Evacuation”

Evacuation Order Zone:
An area where evacuation is required to escape danger. According to the Ministry of the Environment, this refers to zones designated under Article 15, Paragraph 3 of the Act on Special Measures Concerning Nuclear Emergency Preparedness. The former Planned Evacuation Zones and areas within a 20 km radius of the nuclear power plant

were reclassified into the following categories: Zone in Preparation for the Lifting of Evacuation Orders, Restricted Residence Zone, and Difficult-to-Return Zone.

Designated Evacuation Recommendation Zone:
According to the Ministry of the Environment, this refers to specific residential locations within areas where annual radiation exposure is estimated to exceed 20 millisieverts and where decontamination is not readily feasible. Such residences are designated as "Specific Evacuation Recommendation Points." Support related to evacuation and other assistance is provided to households at these designated points, and continuous monitoring is carried out. However, households in these areas that do not wish to relocate are not forced to evacuate.

Evacuation outside of designated evacuation zones:
In contrast to the mandatory evacuations ordered within designated evacuation zones, evacuations undertaken due to concerns about radiation risks have often been called "voluntary evacuations." However, because these decisions are not truly voluntary in the sense of being fully self-determined, the term "evacuation outside the designated zone" is used instead. For example, deciding to evacuate from areas within 80 or 100 kilometers of a nuclear plant that, although internationally recommended, were not officially designated as evacuation zones.

Forced evacuees:
Residents living within an officially designated evacuation zone who were forced to relocate in accordance with evacuation orders. Also referred to as statutory evacuees or zone evacuees.

Voluntary evacuees:
Residents living outside the designated evacuation zones who chose to relocate due to concerns about radiation exposure. This choice often entails risks such as the financial burden of relocation or maintaining dual residences, and the fact that they are typically not eligible for government support schemes.

Mother–child evacuation:
A form of evacuation in which mothers and their children relocate from areas with potential radiation risks, motivated by concerns for the children's health.

PAZ (Precautionary Action Zone):
An area within approximately a 5 km radius of a nuclear facility (in the case of power reactors), where precautionary protective measures—such as evacuation—are implemented even before the release of radioactive materials.

UPZ (Urgent Protective Action Planning Zone):
An area designated for the implementation of urgent protective measures—such as shelter in place, evacuation, temporary relocation, and restrictions on food and water intake—in order to minimize the risk of radiation exposure during a nuclear emergency.

Terms related to "Radiation"

Radioactive materials:
Substances that emit radiation.

- The quantity of radioactive material is measured in becquerels (Bq). 1 Bq is the amount of material in which one atomic nucleus decays and emits radiation per second.
- The amount of radiation energy absorbed is measured in grays (Gy).

Radioactivity:
The capacity of radioactive substances to emit radiation. The term was coined by Madame Curie to mean “the ability to emit radiation.” In recent usage, the word is often used interchangeably with “radioactive substances.”

Radiation dose / Exposure dose:
There are two main units used to measure radiation dose:

- The gray (Gy), which represents the amount of energy absorbed by matter. (1 Gy is when 1 kg of material absorbs 1 joule of energy.)
- The sievert (Sv), which takes into account the different biological effects of radiation types on the human body.

Radioactive fallout
- Dust containing radioactive materials released into the environment as a result of nuclear accidents or nuclear weapons. It is sometimes referred to as “death ash.”

- Nuclear facilities accumulate spent nuclear fuel that contains this “death ash.” Such material continues to emit radiation and heat for hundreds of thousands of years. With the exception of Finland and Norway, no country has yet determined a final disposal site. This is why nuclear facilities are sometimes described as “apartments without toilets” in Japan. This encapsulates the dilemma that while we enjoy the energy produced (living in the apartments), we still lack a final repository for the high-level radioactive waste (the toilet.)

PSEAH (Protection from Sexual Exploitation, Abuse and Harassment):
An abbreviation for “Protection from Sexual Exploitation, Abuse and Harassment.” In the field of international cooperation, this refers to efforts to prevent and respond to sexual exploitation, abuse, and harassment committed by aid workers against people receiving assistance, particularly in development and humanitarian contexts.

Rehabilitative Public Housing:
Public housing provided by Japanese local governments for people who lost their homes due to disasters. The rent is kept affordable, and the housing supports survivors in rebuilding their lives. It is also called Disaster Public Housing.

Acronyms and Full Titles of International Organizations

IAEA : International Atomic Energy Agency :
An autonomous organization headquartered in Vienna, Austria, operating under the auspices of the United Nations.

ICRC : International Committee of the Red Cross:
A Swiss private association headquartered in Geneva, Switzerland, which, under the Geneva Conventions, carries out neutral and humanitarian activities in times of armed conflict as an international institution.

ICRP: International Commission on Radiological Protection
A private, non-profit international scientific organization that issues recommendations on radiological protection. Legally it is a non-profit organization under UK law, with its headquarters located in Ottawa, Canada.

UNFCCC: United Nations Framework Convention on Climate Change
One of the United Nations framework treaties established in 1992, with the ultimate

objective of stabilizing atmospheric concentrations of greenhouse gases (such as carbon dioxide and methane).

UNSCEAR: United Nations Scientific Committee on the Effects of Atomic Radiation

Established in 1955 and composed of scientific experts nominated by UN member states. Its mandate is to comprehensively assess and report on the levels, effects, and risks of human and environmental exposure to ionizing radiation. The secretariat is based in Vienna, Austria.

Part I

What is a Nuclear Disaster?

Chapter1 Basic Knowledge of Radiation Risks

Understanding the impact on health and protecting yourself

Chapter2 User's Guide to Information

Information collection, radiation measurement and recording in the event of a nuclear disaster (Column: Radioactive Material Spreads Faster Than the News)

Chapter 1 Basic Knowledge of Radiation Risks[1]

Understanding the impact on health and protecting yourself

1 The principles of nuclear power generation and the dangers associated with the use of nuclear energy

If you have a magnet and a coil, you can make a generator. A hand-cranked generator works by turning a handle that rotates gears, which in turn rotates a magnet (the rotor) to produce electricity. Attaching blades to this rotor to increase rotational efficiency creates a turbine. The source of power used to drive the turbine determines the method of power generation: using falling water produces hydropower; using wind produces wind power; using steam generated by heat produces geothermal, thermal, or nuclear power. In nuclear power generation, when neutrons collide with the nuclei of uranium-235, the resulting nuclear fission releases an enormous amount of heat energy (the core of a fuel rod reaches about 2,700°C). This heat boils water to create steam, which drives the turbines. However, about two-thirds of the heat produced is excess and is discharged into the sea, warming the seawater. The atomic bomb dropped on Hiroshima, which also used uranium-235 (hereafter "atomic bomb"), caused nuclear fission to occur instantaneously. In contrast, nuclear power plants induce nuclear fission gradually. Nevertheless, in both cases the principle is the same: they utilize the energy released from nuclear fission. When nuclear power is generated, the fission products (the fragments of uranium, also called "death ash") accumulate inside the fuel. Why are they called "death ash"? These uranium fragments naturally decay over time, transforming into stable atoms. But during the process of decay, they release heat and radiation. Exposure to this radiation can cause effects such as those suffered by the victims of the black rain in Hiroshima, the crew of the fishing boat Daigo Fukuryū Maru, the fallout from the Bikini Atoll nuclear tests, and the victims of the Chernobyl nuclear power plant accident—resulting in death, cancer, and various other illnesses. Operating a 1,000,000 kW nuclear power plant for one year produces an amount of "death ash" equivalent to that generated by about 1,000 atomic bombs dropped on Hiroshima. The time required for these radioactive materials to decay to half their original amount varies depending on the nuclide, as shown in Table 1. Because of this, spent nuclear fuel must be carefully shielded from the outside environment and kept cooled over a long period of time. In the event of a nuclear accident, evacuation becomes necessary precisely to escape from this "death ash."

2. Nuclear Power Plant Accidents — How They Differ from Natural Disasters

When an accident occurs, such as at Chernobyl or TEPCO's Fukushima Daiichi Nuclear Power Plant (hereafter "Fukushima Daiichi"), the fission products ("death ash") accumulated inside the reactor are released into the environment, carried by the wind, and dispersed (known as a radioactive cloud or plume), contaminating the surrounding areas as shown in Figure 1.

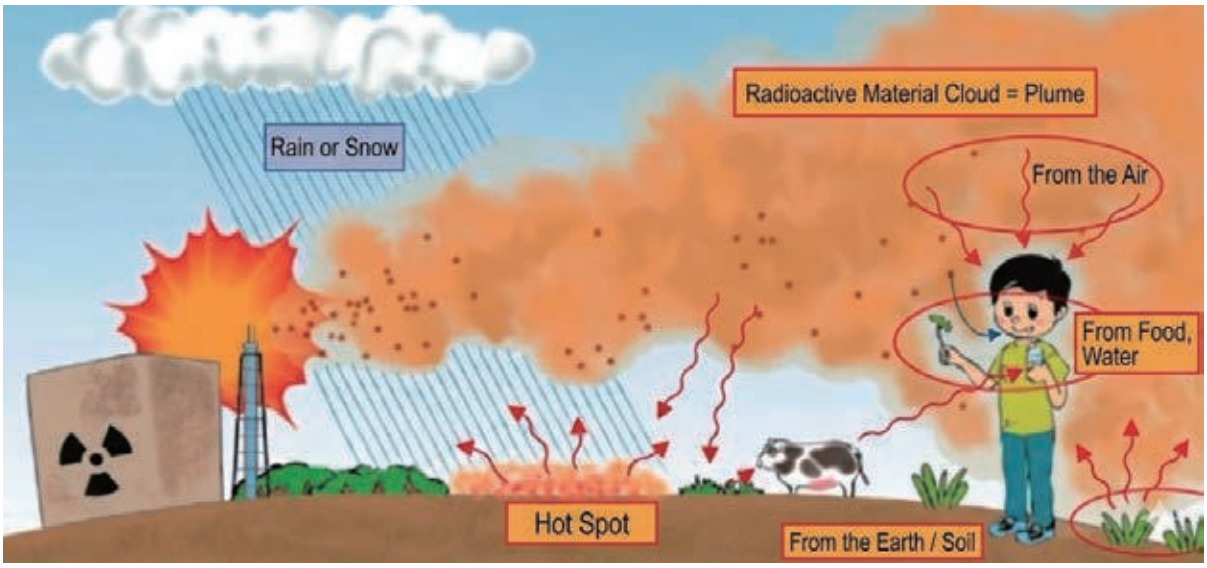

Figure 1. Dispersion of radioactive materials and exposure due to a nuclear power plant accident (with additions to The Encyclopedia of Nuclear Power[2])

[1] This chapter is based on The Encyclopedia of Nuclear Power (Supervised by The Group for Considering Nuclear Education, PHP Institute, 2012), The Group's website Understanding Nuclear Power (https://www.nuketext.org), and X-rays and CT Scans: The Risks of Medical Radiation Exposure (Edited by the Takagi School, Chikuma Bunko).

[2] *Kangaeru Kai for Nuclear Education* (supervised). Understanding Nuclear Power: The Nuclear Power Encyclopedia From Mechanisms to Radiation and Nuclear Power Plants. PHP Institute, 2012.

When rain or snow falls through a plume, radioactive materials attach to the precipitation and settle on the ground, creating hotspots with higher levels of contamination than surrounding areas. Because radioactive materials have no smell, taste, or visible form, a person cannot detect them without a dosimeter, even when standing inside a plume. As a result, people may unknowingly inhale them, absorb them through the skin, or ingest them through contaminated food and drink. Radioactive materials decrease only according to their physical half-life (the time it takes for half of the nuclei to decay naturally), and cannot be eliminated by human power.

Table 1. Half-lives of radionuclides

Iodine-131	: 8 days		
Tritium	: 12.3 years	Cesium-137	: ˜30 years
Strontium-90	: 28.8 years	Cesium-134	: 2.1 years
Plutonium-239	: 24,000 years	Iodine-129	: 15.7 million years
Uranium-235	: 700 million years	Uranium-238	: 4.5 billion years

When people enter areas contaminated by radioactive materials, they are exposed to radiation, which can cause health problems described later. For this reason, entry is prohibited and such areas become evacuation zones. This is the fundamental difference between nuclear disasters, such as those caused by nuclear power plant accidents, and disasters caused by natural catastrophes. In the case of earthquakes, tsunamis, floods, or fires, once the immediate danger subsides, people can re-enter the area without risk, and recovery activities can begin immediately. In contrast, with nuclear disasters, depending on the half-life of the radioactive materials and the degree of contamination, situations can arise where the area remains off-limits for periods far exceeding a human lifetime.

3. Radioactive Materials, Types of Radiation, and Pathways of Exposure

Radioactive materials are substances that emit radiation, and radioactivity refers to the ability of radioactive materials to emit radiation. The relationship between radioactive materials and radiation can be likened, as shown in Figure 2, to the relationship between light and a lamp: the light corresponds to radiation, while the lamp corresponds to the radioactive material. Figure 3 shows the relationship between the types of radiation, their energy, and their wavelength, since radiation is a form of electromagnetic wave.

Although X-rays and gamma rays, which are forms of radiation, share the same properties as visible light and radio waves, their energy is far greater and their wavelengths are shorter. Because of this, these types of radiation can penetrate the human body, whereas light cannot. This is the fundamental difference between radiation and light. As shown in the photograph of a hand taken with X-rays (Figure 4)—a type of radiation discovered by Dr. Röntgen during his experiments—X-rays pass through everything except metal, such as rings, and bone. As will be discussed later, when radiation passes through the body it can damage the DNA within cells, and errors in the repair process may lead to cancer or other illnesses. The reason evacuation zones are established and entry into contaminated areas is prohibited is to prevent radiation exposure caused by this penetrating property of radiation.

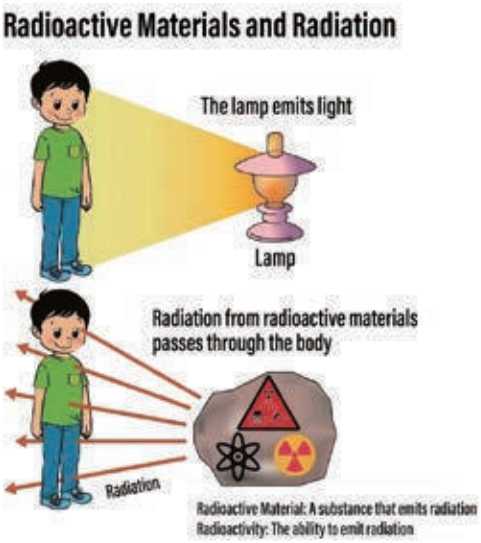

Figure 2 Relationship between Radiation, Radioactive Materials, and Radioactivity
(from Genpatsu ga Wakaru Jiten (Encyclopedia of Nuclear Power[2])

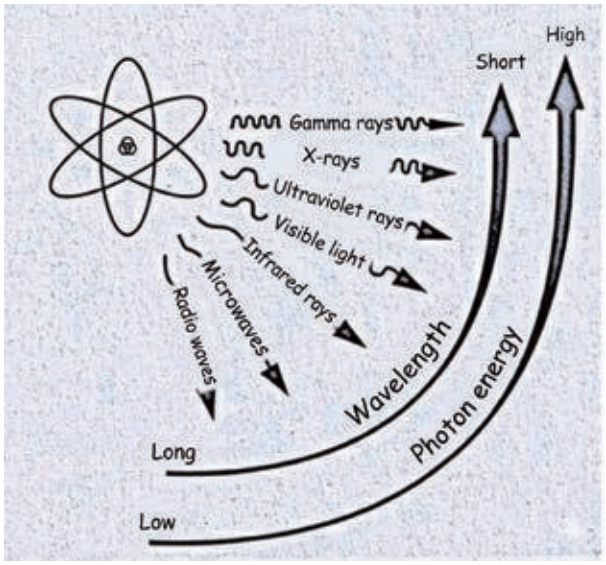

Figure 3 Relationship between Wavelength and Energy of Electromagnetic Waves (from X-ray and CT Examination: The Risks of Medical Radiation Exposure[3])

Figure 4 X-ray photograph of a hand taken by Dr. Röntgen

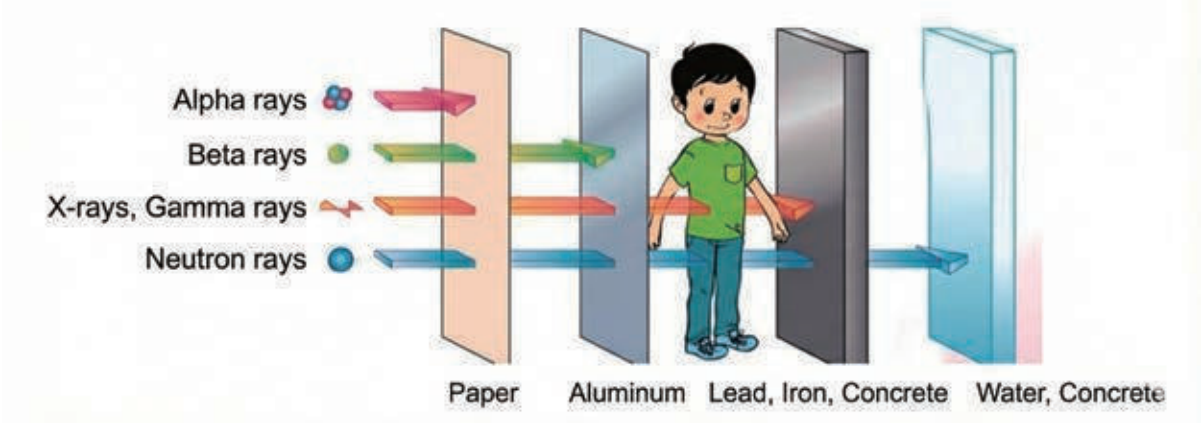

Figure 5 Types of radiation and their penetrating power (from Encyclopedia of Nuclear Power[2])

[3] Takagi School (ed.), X-ray and CT Examination: The Risks of Medical Radiation Exposure, Chikuma Bunko, 2014

Among the byproducts of nuclear fission, there are over forty nuclides[4] with comparatively long half-lives. As they undergo radioactive decay, they release both heat and various types of radiation, as illustrated in Figure 5. Gamma rays, like X-rays, are beams of electromagnetic waves, whereas neutron rays, beta rays, and alpha rays are beams of particle—neutrons, electrons, and helium nuclei, respectively. Because the penetrating power of radiation depends on factors such as its energy, particle size, and charge, the way it affects the human body differs according to where the radioactive material is present.

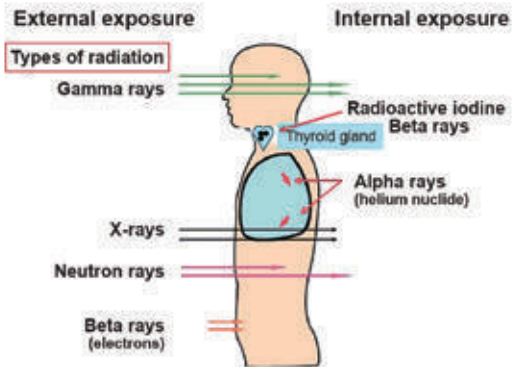

Figure 6 External and internal exposure (created by the author)

As shown in Figure 6, radiation exposure from outside the body is called external exposure, while exposure from radioactive materials taken into the body through breathing or ingestion is called internal exposure. External exposure can be reduced or prevented by placing shielding materials such as concrete, lead, or iron between the body and the radioactive source. Radiation also decreases in proportion to the square of the distance, so moving farther away reduces or avoids exposure. Radiation with short travel distances, such as alpha or beta rays (alpha rays travel less than 1 mm in water), causes no harm if outside the body. However, once inside the body and taken up by tissues or cells, even these short-range radiations can damage surrounding cells.

4. Relationship Between Radiation Dose and Health Effects (Radiation Risk)

The effects of radiation on the body depend on the dose received. Dose can be measured as absorbed dose in gray (Gy), where 1 Gy is defined as 1 joule of energy absorbed per kilogram, or as sievert (Sv), which accounts for differences in biological impact. Using cancer incidence in adult males as a reference, 1 Gy of X-rays, gamma rays, or beta rays is considered equivalent to 1 Sv. Alpha radiation exhibits significant biological effects even at a dose of 1 Gy, corresponding to an equivalent dose of approximately 20 Sv. The biological effectiveness of neutron radiation, however, depends on its energy; consequently, a dose of 1 Gy is considered to correspond to an equivalent dose ranging from 5 to 20 Sv, depending on the neutron energy.

The International Commission on Radiological Protection (ICRP) sets the annual radiation dose limit for the general public at 1 mSv (1 mSv = 0.001 Sv), a standard adopted by many countries with nuclear power plants, including Japan. But what does it mean to receive a dose of 1 mSv? As shown in Figure 7, it means that, on average, a single radiation track passes through the nucleus of a cell (about 0.008 mm in diameter), which contains the DNA serving as the body's blueprint. The adult human body is made up of roughly 30 trillion cells, and an annual whole-body exposure of 1 mSv corresponds to an average of one radiation track passing through the nucleus of each cell over the course of a year.

[4] Ken Seo. Nuclear Power Plant Accident... What Will You Do Then! Fubaisha, 1995.

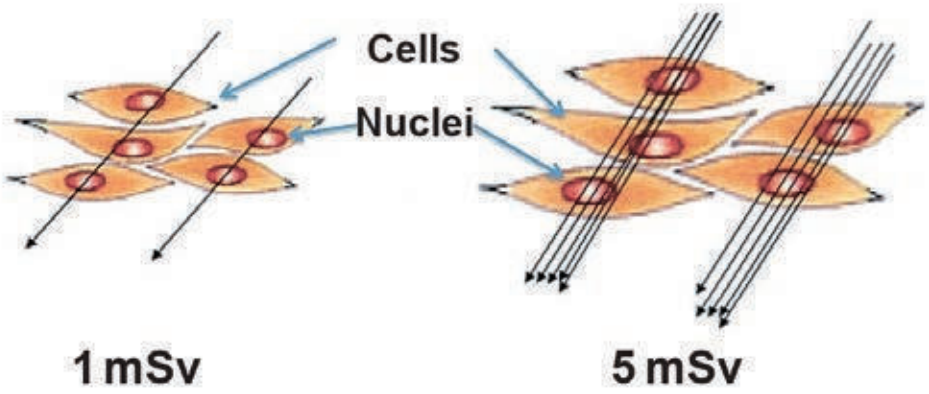

Figure 7. What does it mean to receive 1 millisievert of radiation?
(from The Encyclopedia of Nuclear Power)

Because the energy of radiation is far greater than the binding energy between atoms in the molecules that make up the human body, even a single track can damage DNA and other molecules within a cell. Damage to DNA, which serves as the blueprint of the body, is particularly serious (Figure 8). Cells are capable of repairing DNA damage; however, radiation-induced damage differs from naturally occurring damage in that it often involves complex lesions (where, in addition to a double-strand break, other nearby damage occurs). As a result, errors are more likely to occur during repair, and such incorrect repair can lead to mutations that may later cause cancer)

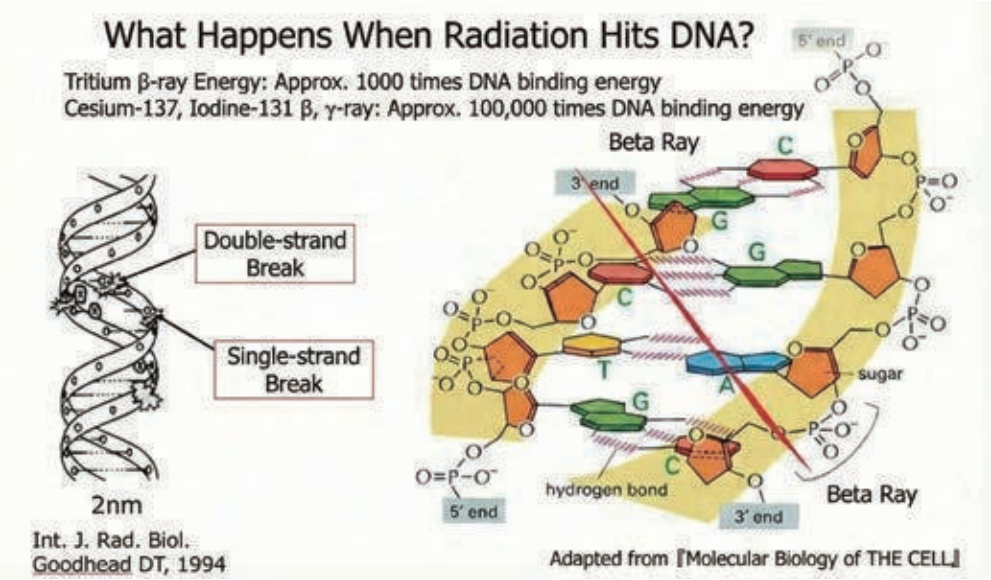

Figure 8. Difference between the binding energy of atoms constituting DNA and the energy of radiation, and DNA damage caused by radiation
Source (left): Goodhead D.T., J. Rad. Res. 40, 1999
Source (right): Alberts B. Molecular Biology of the Cell
(Text in red was added by the 3.11 Children's Thyroid Cancer Fund, NPO)

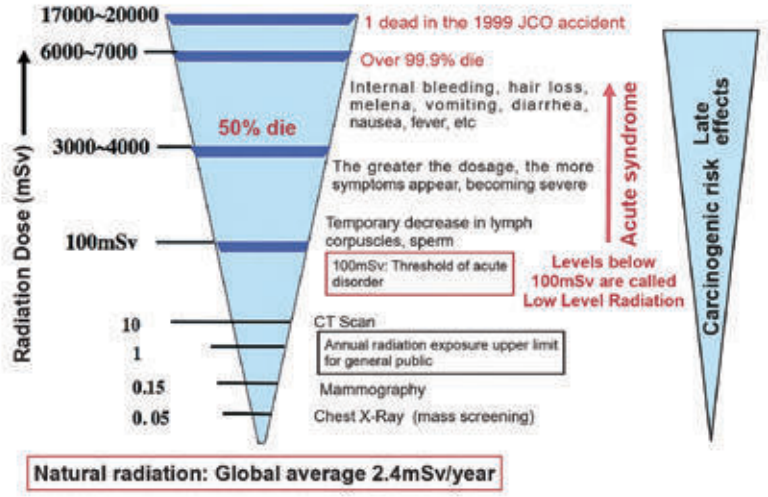

Figure 9. Relationship between radiation dose and health effects (created by the author)

Exposure of the whole body to nearly 7,000mSv (7Sv) of radiation at once causes about 250[5] complex DNA damages per cell, resulting in the death of more than 99.9% of people.

The radiation dose at which 50% of people die is 3,000–4,000 mSv. When exposed to such a large amount of radiation, symptoms such as nausea, vomiting, diarrhea, and fever appear; if the exposure is more severe, bloody stools, hair loss, and purpura occur, leading to death. These symptoms appear within a short time after exposure and are called acute effects. Because they occur without exception in everyone, they are also referred to as deterministic effects. At 100 mSv, highly radiosensitive cells such as lymphocytes and sperm temporarily decrease, while at doses below 100 mSv, acute symptoms are said not to appear in more than 90% of people. For this reason, this dose (100 mSv) is regarded as the “threshold” for acute effects, and exposures below 100 mSv are classified as low-dose (see Fig. 9).

Even people who recover from acute disorders caused by high-dose radiation exposure remain at risk of developing late effects such as cancer years or even decades later, depending on the dose they received. This is because their DNA has been damaged, and unlike ordinary infectious diseases, recovery does not involve acquiring immunity.

Most low-dose radiation exposure comes from medical procedures involving artificial radiation and from natural background radiation. In recent years, medical exposure has been on the rise globally and has become a concern for the United Nations Scientific Committee. In particular, in countries such as the United States[6] and Japan, where the use of high-dose CT scans has increased, it has been reported that about 4 to 5 percent[7,8]of cancers are attributable to medical exposure. Natural background radiation averages about 2.4 mSv per year worldwide, and 2.1 mSv per year in Japan. This is something no one can avoid. That said, it cannot be considered harmless. Large-scale epidemiological studies have reported that low-dose exposures such as natural radiation can also contribute to childhood leukemia and tumors of the central nervous system.[9]

In this way, even low-dose radiation exposure increases cancer incidence in proportion to the dose, and there is no threshold value below which cancer does not occur. In other words, there is no safe level of radiation.

On the other hand, even without radiation exposure, tens of thousands of DNA lesions occur naturally in each cell every day. However, because cells possess repair mechanisms, these damages are usually repaired correctly, leading some to argue that a small additional number of lesions from radiation would not pose a problem. However, radiation-induced damage is different from the naturally occurring lesions that are routinely repaired. As noted above, in the case of whole-body exposure,

[5] Rothkamm K.& Lobrich M. (2003) Evidence for a lack of DNA double-strand break repair in human cells exposed to very low x-ray doses. Proc. Natl. Acad. Sci.USA.100, 5057-62.

[6] Smith-Bindman R, et al., (2025) Projected lifetime cancer risks from current computed tomography imaging. JAMA Intern Med. doi:10.1001/jamainternmed.2025.0505.

[7] Berrington A.G., Darby S., (2004) Risk of Cancer from diagnostic X-rays estimates for the UK and 14 other countries. Lancet, 363, 345-351.

[8] Takagi School (ed.), X-ray and CT Examination: The Risks of Medical Radiation Exposure, Chikuma Bunko, 2014

[9] Spycher BD, et al., (2015) Background ionizing radiation and the risk of childhood cancer: A census-based nationwide cohort study. Environmental Health Perspectives, 123, 622-628.

a lethal dose corresponds to about 250 DNA double-strand braks per cell—damage of an entirely different nature from the tens of thousands of single-strand braks that arise daily and are repaired.

The ICRP considers the “linear no-threshold (LNT) model,” shown in Figure 10, to be the most appropriate basis for radiation protection when examining the relationship between dose and cancer risk. According to this model, if 10,000 people are each exposed to 1 mSv, one of them is expected to develop cancer; at 10 mSv, 10 individuals would be expected to develop cancer.

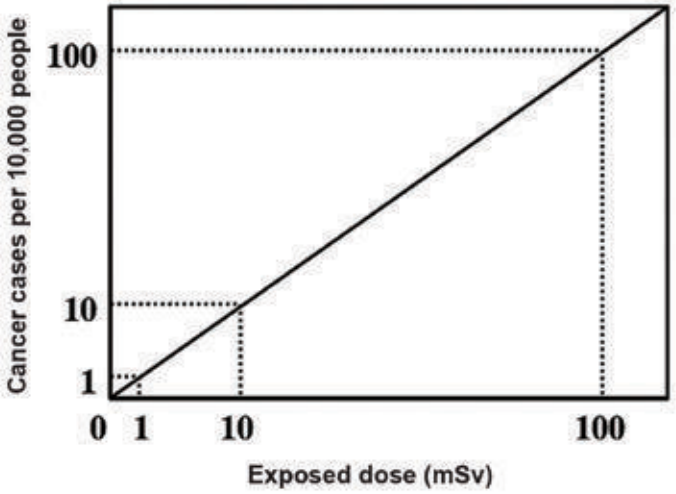

Figure 10. Relationship between radiation dose and cancer incidence: the Linear No-Threshold (LNT) model (ICRP)

However, this estimate is based on the assumption that the cancer risk from chronic exposure is half that of acute exposure, derived by halving the risk observed among the Hiroshima and Nagasaki atomic bomb survivors (who experienced acute, high dose-rate exposure). Recent large-scale epidemiological studies of nuclear facility workers (chronic, low dose-rate exposure) have reported that the risk per unit dose is comparable to that from acute exposure. Consequently, the ICRP’ s assessment has been subject to considerable criticism for underestimating risk. In contrast, organizations such as the WHO, IAEA, and UNSCEAR, which also employ the Linear No-Threshold (LNT) model, maintain that the risk of radiation exposure is the same regardless of whether the dose is received all at once or gradually over time, provided the total dose is equivalent.

Sensitivity to radiation is higher in fetuses and infants, in whom DNA synthesis is particularly active, and it decreases with age. Moreover, because children have a longer remaining lifespan, they face greater cumulative opportunities for subsequent exposure to radiation and other carcinogenic agents, making them especially vulnerable. Radiation sensitivity also differs by sex, with women being more sensitive than men (see Figure 11).

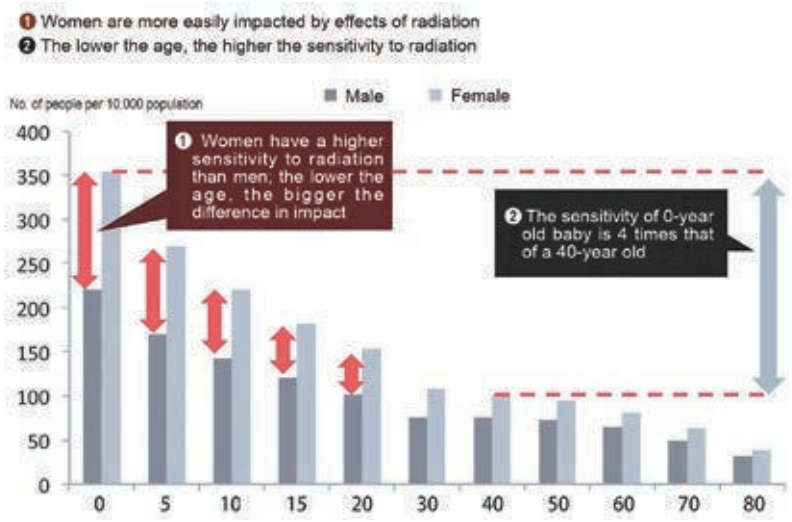

Figure 11. Radiation sensitivity by sex and age (vertical axis: cancer incidence per 100,000 population).
(The National Diet of Japan. (2012). Fukushima Nuclear Accident Independent Investigation Commission, Official Report Tokuma Shoten.[10])

5. Efficacy of Stable Iodine Tablets

The Chernobyl nuclear power plant accident made it clear that radioactive iodine released during a nuclear accident can cause thyroid cancer. Once inhaled, radioactive iodine is absorbed through the lungs; when ingested via food or drink, it is absorbed through the intestinal tract; and it can also be absorbed through the skin, subsequently entering the bloodstream.

The thyroid is an endocrine organ that secretes thyroid hormones. Since the production of a single thyroid hormone molecule requires four iodine atoms, the thyroid takes up approximately 10–30% of the iodine present in the bloodstream. Because radioactive iodine and non-radioactive iodine (stable iodine) share the same chemical properties, the thyroid incorporates them indiscriminately. During a nuclear emergency, the administration of stable iodine tablets increases the concentration of stable iodine in the bloodstream, thereby reducing the relative concentration of radioactive iodine and suppressing its uptake into the thyroid. The timing of administration is critical in order to achieve an effective protective effect.

If stable iodine tablets are taken from 24 hours prior to exposure up to within 2 hours after exposure, more than 90% of radioactive iodine uptake can be prevented. However, beyond this window, the protective effect diminishes with time, and by 24 hours after intake of radioactive iodine, little to no preventive effect can be expected. Therefore, stable iodine tablets should be kept readily available, and upon learning of a nuclear accident, they should be taken immediately before proceeding with evacuation. The guidelines for stable iodine administration are shown in Table 2.[11]

[10] Tokyo Electric Power Company Fukushima Nuclear Accident Independent Investigation Commission. (2012). National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission Report. Tokuma Shoten.

[11] Nuclear Regulation Authority, Radiation Protection Planning Division. On the distribution and administration of stable iodine tablets. https://www.nra.go.jp/data/000396856.pdf

Table 2. Appropriate Single Dosage of Stable Iodine Tablets

Patient Group	Elemental Iodine (mg)	Potassium Iodide (mg)	Potassium Iodide Formulation
Under 1 month old	12.5	16.3	Gel Pack (16.3mg) × 1
1 month old to under 3 years old	25	32.5	Gel Pack (16.3mg) × 2 or Gel Pack (32.5mg) × 1
3 to under 13 years old	38	50 mg	Tablet (50mg) × 1
13 years and older	76	100 mg	Tablet (50mg) × 2
13 years and older	76	100 mg	Tablet (50mg) × 2

Since the Fukushima nuclear accident, stable iodine tablets have been pre-distributed to households, but only within a 5 km radius of the plant. Residents living between 5 and 30 km are expected to receive them during evacuation.

In Conclusion

Many experts continue to argue that “there is no evidence that cancer incidence increases at doses below 100 mSv” or that “the effects of low-dose radiation remain uncertain.” However, the risks associated with low-dose radiation exposure have become sufficiently evident that international organizations such as the ICRP, WHO, and IAEA have adopted the “linear no-threshold (LNT) model,” which assumes that there is no safe threshold of exposure. Accordingly, radiation exposure should be avoided as much as possible. In the event of a nuclear accident, confusion is inevitable; therefore, support organizations, caregivers, and residents must, during non-disaster times, acquire an accurate understanding of the health effects of radiation and make the necessary preparations to protect their own health.

(Hisako Sakiyama)

Chapter 2 User's Guide to Information

Information collection, radiation measurement and recording in the event of a nuclear disaster

In 2011, the accident at the Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Plant unfolded in the aftermath of the earthquake and tsunami, which caused a total loss of power, subsequent core meltdowns, and hydrogen explosions in three reactor buildings (Units 1, 3, and 4). These events resulted in the widespread release of radioactive contamination. In the days that followed, evacuation zones were progressively expanded outward in concentric circles from the plant—2 km, 3 km, 10 km, and eventually 20 km—as the situation evolved over time. Amid these rapidly changing conditions, it remained extremely difficult to obtain an accurate grasp of the situation, and many neighboring municipalities as well as residents experienced delays in receiving information, leading to postponed evacuations. No source-term data were provided to SPEEDI[1] (the System for Prediction of Environmental Emergency Dose Information), which is designed to forecast the dispersion of radioactive materials. As a result, it remained impossible to calculate either the concentrations of radionuclides or the ambient dose rates in the vicinity of the plant.[2] Ordinarily, when entering a disaster site for relief operations, responders are expected to acquire prior knowledge of local conditions and to formulate specific activity plans that address the needs of affected populations. In the case of the Fukushima Daiichi nuclear accident, however, such information did not reach on-site responders or municipal authorities, and some residents were left stranded in close proximity to the plant. From the lessons of Fukushima, it is necessary to highlight the risks that are unique to nuclear disasters, particularly the challenges associated with the handling of information under such conditions. Building on these lessons, this section proposes guidelines—a kind of "instruction manual" for information management—tailored to the specific circumstances of nuclear emergencies.

1 Introduction

(1) For Safe Operations: The Importance and Challenges of Information in the Early Stages of Disasters

Nuclear disasters may arise from natural hazards such as earthquakes, tsunamis, or floods, from deliberate attacks on nuclear facilities (e.g., terrorism), or from human error. Their occurrence is typically sudden and may lead to severe consequences, making the acquisition of accurate information exceedingly difficult. In certain situations, announcements from the government, local authorities, or the nuclear plant operator may be absent or limited. Furthermore, depending on the timing of such announcements, discrepancies with on-the-ground realities, confusion due to conflicting reports, and frequent revisions of information may occur.

In general, organizations and individuals engaged in humanitarian assistance assess the risks of the areas in which they operate and conduct activities only under conditions where safety can be secured. However, it is also important to recognize that the significance and use of specific information vary depending on the recipients, the location of activity, organizational context, and position. Decisions regarding operational policies should therefore be made on the basis of comprehensive analysis of available information, incorporating perspectives from multiple levels of stakeholders before reaching a final judgment. This section outlines the definition of information and offers recommendations on its significance and effective use in support of sound decision-making.

(2) Definition of Information

Here, "information" shall refer to knowledge required to assess circumstances and to choose actions or operations that ensure the safe relief and related activities during a nuclear disaster.

(3) Characteristics of Nuclear Disasters

The defining feature of a nuclear disaster is that accidents at nuclear power plants or related facilities can release and disperse radiation into the environment, creating the potential for radioactive contamination. Because radiation cannot be detected by the human senses, the risks it poses are difficult to perceive or assess. Furthermore, it is also challenging to foresee cascading consequences, including broader social disruption.

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[1] Refer to Glossary Page

[2] Report of the Japanese Government to the IAEA Ministerial Conference on Nuclear Safety — The Accident at TEPCO's Fukushima Nuclear Power Stations — XII
https://www.kantei.go.jp/topics/2011/iaea.houkokusho.html Accessed June 2021; November 11, 2024.

The Fukushima Daiichi nuclear power plant accident developed into a large-scale, compound disaster. It was not limited to damage at the nuclear facility, but also involved an earthquake, tsunami, fire, mass evacuations, and radiation exposure. Such disasters can extend far beyond the confines of the plant itself. When events exceed the assumptions of disaster manuals and forecasts, the challenge of collecting reliable information intensifies at the same time.

Taking these characteristics into account, and focusing especially on radiation protection in the immediate aftermath of an accident, the following key points warrant particular attention.

① Weather, wind direction, and the dispersion of radioactive materials (since radiation does not spread in concentric circles, it is necessary to monitor the flow of the radioactive plume and avoid moving downwind)

② Information on radiation protection measures (to avoid both external and internal exposure: evacuation, sheltering in buildings with strong shielding effects, taking stable iodine tablets etc.)

(4) Handling Information— Examining and Verifying from Multiple Sources and Perspectives

In nuclear disasters, information is often fragmented and intermittent, making it nearly impossible to grasp the full situation from a single source. Moreover, such information may carry "bias" (inaccuracy, imbalance, or assumptions), requiring constant awareness that no information is perfect and that verification is essential. For this reason, it is important to consult multiple reliable sources and cross-check different perspectives in order to collect and assess information more accurately (see section "Information Gathering and Analysis").

During disasters, governments and other authorities often disseminate information through immediate channels such as the internet and social media. However, some of this information may lack clear evidence or later prove to be incorrect. Especially for major incidents, given their wide impact, it is essential that organizations and institutions (see Table 1, Section 2 "Information Gathering and Analysis") cross-check the information before sharing it internally or releasing it externally. Local governments, civic groups, NGOs/NPOs, media outlets, and other actors on the ground should consult diverse sources. In addition, even during times of normalcy, attention should be paid to information from trusted organizations and individuals, while maintaining active connections not only with national and local governments but also with these reliable groups.

2 Information Gathering and Analysis

(1) Information Gathering

During a nuclear disaster, significant discrepancies may emerge in the content, volume, and quality of information provided by coordination headquarters, relief organizations, government announcements, and the media. To ensure effective response activities, it is strongly recommended that information-gathering efforts be undertaken during normal conditions. It should also be recognized that general and context-specific sources of information regarding nuclear emergencies vary across countries and regions. Furthermore, in the event of a severe accident, neighboring countries may also serve as important sources of information.

Examples of Information to be Gathered

1 The situation and causes of accidents at nuclear facilities (or during the transport of nuclear fuel), including the progression of accidents or conflicts and the current state of response

2 The presence and status of radioactive material dispersion, the amount of radioactive material released, changes in measured values at the site of activity, and contamination levels (including readings confirmed by monitoring devices)

3 Information on the future impacts of radiation (meteorological conditions for dispersion prediction such as wind direction, wind speed, weather, terrain, and distance from the nuclear facility)

4 The damage status of social infrastructure (roads, public facilities, etc.)

5 The movements of residents (evacuation behavior, evacuation centers and temporary housing, necessary supplies, etc.)

6 The responses of the government and municipalities (instructions to residents, issuance of warnings and advisories, etc.)

(2) Analysis

In a nuclear disaster, a large volume of diverse information will circulate. Before incorporating any of it into your activities, screen and analyze what appears accurate, appropriate, and reliable. Official announcements, including those from the government, are not infallible. Consult multiple

sources and conduct double and, where possible, triple checks.

Table 1: Examples of major information sources: At the time of the March 11 Fukushima Daiichi Nuclear Power Plant accident

Central Government and Administration	Ministry of Economy, Trade and Industry, Nuclear Regulation Authority
Police	National Police Agency, Tokyo Metropolitan Police Department, local prefectural police departments and police stations
Self-Defense Force	Ministry of Defense, local Self-Defense Forces (including garrisons, military forces, and special military organizations of the government, depending on the country)
Fire Department	Fire Department, local fire headquarters/fire station, local fire brigade
JMA	Japan Meteorological Agency, private weather forecasting agencies, and international weather observation agencies
Local Governments	Prefectural offices, municipal offices
Welfare Organizations	Prefectural and municipal social welfare councils
Medical Professionals	The Japanese Red Cross Society, the Japan Medical Association, the Japan Nursing Association, Médecins Sans Frontières, AMDA, and disaster medical assistance teams (DMAT) from prefectures and medical institutions.
NPO/NGO/ Volunteer Bodies	Organizations and groups include: the Refugee Assistance Association; JANIC (Japan NGO Center for International Cooperation); the Japan Civil Network for Support of the Great East Japan Earthquake (JCN); the Citizens' Nuclear Information Center (CNIC); local citizen radiation monitoring stations; and citizen groups concerned with and conducting research on radiation risks.
Mass Media	NHK (public broadcasting), TV, newspapers, radio (national and local stations)
Overseas	IAEA, WHO, neighboring governments, and international disaster response agencies
Internet	Above organization websites, etc.
Other	Universities, research institutions, public and private radiation measurement centers, experts on nuclear facilities, disasters, and radiation exposure

3 Distribution and dissemination of information

(1) Exchange information with as many organizations as possible.

Information obtained from other organizations, groups, or one's own sources should be carefully examined and analyzed, then exchanged and shared with as many different organizations and groups as possible to support relief efforts. The aim is not only to enhance accuracy but also to foster vigilance in light of the inherent unpredictability of nuclear disasters and the critical need for radiation protection.

With respect to information sharing and transmission, it is essential to establish clear policies during non-disaster times, and to put in place systems that allow for rapid response. These systems should include protocols for handling information and adjusting field activities when critical data becomes available during a nuclear emergency. Importantly, the presence of a nuclear facility in a community does not guarantee timely access to information. During the Fukushima nuclear accident, delays in communicating key information to local governments, nearby residents—including hospital patients and care facility residents—led to significant lags in evacuation. In view of this, strategies for the collection, sharing, and dissemination of information must be prepared in advance.

(2) Understanding and Handling Official Announcements

Official announcements issued by the government, local authorities, and specialized organizations, as well as media reports based on these announcements, should always be monitored. Table 2 outlines key points to consider and recommended approaches for handling such information. In all cases, it is advisable to establish ahead of time methods of review, responsible units within the organization, and standards and procedures for making announcements.

Table 2 Points to Note Regarding Official Announcements

Type of Announcement	Points to Note
Official Announcements	Handle on the premise that it will be updated constantly. Cross-check with other sources through double or triple verification.
Urgent Information	Since it is difficult to determine authenticity, priority should be given to information that is transmitted according to certain standards, such as clearly indicating the source at the time of dissemination.
Information that Differs from Official Announcements	Even information that contains uncertainties may sometimes need to be conveyed to relevant parties. In such cases, it should be reviewed against the organization's standards, considering not only whether to share it but also how it should be communicated. When transmitting such information, it may be appropriate to include key notes—such as differences from official announcements or the sources of information—but such sharing should remain limited in scope.

(3) Consideration for the "Information Vulnerable"

In the event of a nuclear disaster, so-called "information vulnerable" populations are placed in even more difficult circumstances. These include older adults, persons with disabilities, children, people who do not use smartphones or the internet, and foreign residents whose first language is not the local language. From the stage of preparedness during normal times, it is essential to recognize the need for special consideration for these groups and to establish methods of information dissemination that meet their needs. To this end, building networks with relevant organizations and local community groups is of vital importance.

4 Measurement and Recording of Radiation Levels

In the event of a nuclear disaster, confirming radiation levels is of critical importance. To enable independent assessment, organizations and individuals should collect information through their own measurements and records. Governments, municipalities, universities, and research institutes typically maintain monitoring posts or keep equipment available for emergency use. Radiation measuring devices—whether fixed, portable, or handheld—each have distinct detection ranges and characteristics. Employing multiple types of devices, depending on the situation and region, provides a more comprehensive basis for judgment. At the individual level, an effective precaution is to configure devices to issue an alarm when radiation levels rise, thereby adding an extra layer of safety.

When conducting measurements in areas where radiation levels are rising, or in regions with levels higher than normal, it must be noted that approaching the source of contamination increases the risk of personal exposure.

(1) Exposure Management

In the aftermath of the Fukushima Daiichi accident, many organizations and individuals carried out activities without a clear understanding of regional contamination levels or personal exposure doses, partly due to an initial shortage of monitoring devices.

These issues call for the following recommendations.

1 Measurement and Recording of Radiation Dose (Exposure Dose)

The risk of health damage caused by radiation can be quantified and visualized based on the measured exposure dose. In order to keep the total exposure dose of workers within safe limits, it is necessary to regularly record and manage the exposure dose.

2 Establishment and Communication of Dose Limit Standards

Organizations and groups that dispatch personnel to nuclear disaster response activities should establish, clearly state, and disseminate dose limit standards in advance. These standards must comply with the relevant national and regional laws and regulations. The purpose of setting such standards within support organizations is to enable unified dose management, implement measures to minimize exposure as much as possible, and reduce the health impacts of radiation. However, it must not be forgotten that the consensus in radiation protection is that "there is no safe level of exposure." It is essential that personnel adhere to the dose limit standards established by their

organization. Furthermore, if an individual maintains stricter personal standards, the organization should respect those as well.

For reference, the Japanese Red Cross Society, in its Guidelines for Relief Activities in Nuclear Disasters, stipulates that the cumulative exposure dose of personnel during the course of their annual activities should not exceed 1 mSv. While this limit does not apply to medical personnel engaged specifically in nuclear disaster response, standards are set to ensure that exposure does not exceed levels such as 50 mSv per year, which is the limit established for radiation handling works.

3 Management of Radiation Exposure

The management of radiation exposure is to be carried out by the aid organizations, personnel, or volunteers envisioned in this guide. Individuals engaged in activities should always carry a “field log” or notebook, record measurement values regularly, and the aid organization should periodically review these records to determine whether continued engagement in activities is appropriate.

(2) Recording

In aid activities, it is recommended to keep regular records of each day’s work, for example at the end of the day. During nuclear disaster response, there may be situations where aid workers enter and operate in areas contaminated with radioactive materials. In such cases, maintaining detailed activity records becomes critically important for monitoring long-term health, and may also serve as evidence or justification when seeking medical expense reimbursement or compensation in the event of illness or injury.

①Keeping Activity Records

An activity log should ideally be in a format that is easy for aid workers to carry (for example, pocket-sized or notebook-sized to fit easily into a bag). A tabular format with clearly defined entry fields is especially practical.

Table 3: Examples of Record Items

Record Item	Details
Date and Time	
Activity and Operation Records	Activity Locations: Detailed records of time spent and places visited indoors and outdoors (Example: whether the building is wooden or a well-shielded concrete structure, or whether the outdoor environment is farmland or forest, etc.)
	Specific details of activities (work) and required working hours
Radiation Protection and Exposure-Related Matters	Weather conditions, including whether one was exposed to rain or if it was windy
	Whether or not masks and protective clothing were worn
	Radiation measurements to the extent possible (readings from personal dosimeters, Geiger counters, daily cumulative dose, etc.)
	Radiation measurement results from screening centers for body, vehicles, equipment, etc.
	Internal exposure test results (whole-body counter readings)
Food and Drink	Food and drink intake, including source and details
Health	Presence or absence of physical or mental changes
Medicine	Intake of stable iodine tablets and regular medications (if any)
Notable Incidents	Examples: evacuation urged via radio news; continued aftershocks; increase in evacuees from the area near the nuclear plant; major operations conducted at the accident site, etc
Other	Challenges encountered on site, lessons learned, information that proved useful for affected people, improvements made, and other notes for future reference

②Equipment for Measurement Records

In the event of a nuclear disaster, ensuring the safety of relief workers must be the foundational priority. Radiation monitoring plays a key role in alleviating the concerns of those engaged in relief efforts, while also enabling them to provide more effective assistance to affected populations. For details on the equipment necessary to ensure safety, including that used for measurement and monitoring, refer to Part II, Chapter 1.

③Retaining and Sharing for Disaster Prevention and Risk Reduction

Nuclear disasters remain a real and pressing risk, given the global presence of nuclear power plants and the possibility that nuclear facilities may be targeted during wars or conflicts. Records of activities in disaster affected areas, such as individual aid experiences, insights and lessons learned, and the techniques and knowledge acquired, contain extremely valuable information. These should be preserved and shared so they can contribute to future disaster prevention and risk reduction.

It is incumbent upon organizations and individuals who have completed their activities to ensure that their experiences are carefully recorded and preserved, and that these accounts are shared broadly both within and beyond their organizations. In some cases, such records are compiled as documentation of activities undertaken in the context of a nuclear disaster. Through the accumulation of such efforts, society can strengthen preparedness for future disasters, renew awareness, and foster a sustained commitment to disaster prevention and risk reduction. It likewise falls to aid workers to help ensure that the importance of these lessons is widely shared and redoubled across society.

(Hiroko Aihara)

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Column: Radioactive Material Spreads Faster Than the News

When the Fukushima Daiichi Nuclear Power Plant accident occurred in March 2011, the government, plant operators, local municipalities, fire services, and many other institutions fell into confusion, and information became tangled and contradictory. In such situations, it is critical to obtain timely information about the nature and causes of the accident, as well as whether radioactive materials have been released beyond the reactor buildings or dispersed outside the plant grounds. There may also be cases where, even before evacuation orders are issued by the government, local authorities, or disaster response headquarters, it becomes necessary to initiate evacuation based on one's own judgment.

In the early stages of a nuclear accident, plant operators may perform a "containment vent" to prevent an explosion. This procedure releases air from inside the reactor to reduce internal pressure. However, the vented air can contain high concentrations of radioactive materials. Once released beyond the containment vessel, these radioactive substances may be carried by wind or clouds and eventually descend to the ground, leading to environmental contamination and exposing nearby residents to radiation.

In some cases, residents may be instructed to shelter indoors (such as staying inside homes, schools, or public buildings). However, this becomes impossible if the structure is damaged, and it is said that even in concrete buildings, indoor radiation levels can reach the same level as outdoors within 24 hours. When food and water supplies are cut off, stored provisions are limited, making long-term sheltering indoors impractical.

During the Fukushima nuclear accident, some residents—such as families caring for ill members who could not be relocated—remained sheltered in their homes. However, power outages, food shortages, and lack of access to medical care left them increasingly isolated. This experience demonstrates the clear limits of prolonged sheltering at home. In the event of a large-scale nuclear disaster, evacuation must ultimately be expected. When evacuating, it is also crucial to avoid moving directly into the path of the radioactive plume.

Part Ⅱ

Guidance for Initiating Assistance in the Event of a Nuclear Disaster

Chapter1 Mobilisation and Dispatch of Supporter/Volunteers (Advance Preparations/Emergency Assistance)
Readiness to prevent exposure

Chapter2 Key Considerations for Providing Evacuation Support (Advance Preparations)
The Complexities arising from variations in evacuation origin zones

Chapter3 Supporting the Operation of Evacuation Centres (Emergency Assistance)
Diverse needs far exceeding those of normal natural disasters
(Column: Unique Circumstances Experienced by Evacuees during Nuclear Emergencies)

Chapter4 Support for Disaster-affected Communities (Emergency Assistance/Long-term support)
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Chapter5 Support for People with Care Needs and Learning Support for Children (Emergency Assistance/Long-term support)
Relief that leaves no one behind

Chapter 1 Mobilisation and Dispatch of Supporter/Volunteers (Advance Preparations/Emergency Assistance)

Readiness to prevent exposure

Once a large-scale and severe nuclear disaster occurs, radioactive contamination spreads not in neat concentric circles around the site, but across a wide area influenced by wind direction, rainfall, or snowfall. Areas of high contamination are designated as exclusion zones, while surrounding areas are successively designated as evacuation zones. Residents of these regions—including hospital inpatients and residents of social welfare facilities—must evacuate to surrounding or more distant areas in order to avoid radiation exposure.

For example, in the case of the Chernobyl accident that occurred on April 26, 1986, residents of the nearby city of Pripyat were evacuated on the following day, April 27, and from May 1 onward, between 100,000 and 250,000 residents living within a 30-kilometer radius were evacuated.

In the case of Fukushima Prefecture, the earthquake and subsequent tsunami caused by the Great East Japan Earthquake on the afternoon of March 11, 2011, resulted in the immediate deaths of 1,831 people, or 4,179 including disaster-related deaths, mainly along the coastal areas. Nearly 100,000 houses were either completely or partially destroyed. [1] Following the loss of all power at the Fukushima Daiichi Nuclear Power Plant due to the tsunami and the worsening of the situation, an evacuation order was issued on the night of March 11 for residents within a 3 km radius, expanded early on March 12 to within 10 km, and later that same evening to within 20 km. On March 15, residents within the 20–30 km zone were instructed to shelter indoors. As a result, by May 2012—approximately one year after the earthquake, tsunami, and nuclear disaster—24,644 people had evacuated to locations both inside and outside Fukushima Prefecture.

In such cases, the primary activity sites for external supporters and volunteers are usually evacuation centers where displaced residents have taken shelter. However, even in areas officially designated by the government as having low levels of radioactive contamination—and therefore regarded as safe—conditions were not necessarily without risk. Within zones considered to have sufficiently low contamination, localized pockets of high radiation (“hot spots”) could still be present. Consequently, aid workers and volunteers on the ground sometimes encountered higher levels of exposure than they had anticipated.

Relief organizations that mobilize and dispatch personnel often set up local offices or lodgings around evacuation centers to ensure continuous and effective relief activities. As a result, aid workers and volunteers who live and work in these areas may also be exposed to low levels of radiation, or in some cases higher levels, much like the evacuees themselves. At the same time, those who are residents of the affected region may find that their own homes have also been contaminated to some degree by radioactive materials.

For example, Fukushima City, the prefectural capital, is located 60 to 80 kilometers from the Fukushima Daiichi Nuclear Power Plant and was therefore not placed under an evacuation order. However, immediately after the accident, on March 15, the city recorded radiation levels of 24.24 μSv/h (microsieverts per hour[2])—more than one hundred times the general public exposure limit of 0.23 μSv/h (equivalent to 1 millisievert per year). Because no evacuation order had been issued, Fukushima City also became a host location for many evacuees from areas closer to the plant, and relief activities were actively carried out. Consequently, external aid workers in the city followed organizational or personal safety measures—such as carrying Geiger counters or glass badge dosimeters, limiting outdoor activities, and ensuring annual exposure remained below one millisievert—to minimize radiation risk. Even so, in addition to unavoidable exposure in daily life, many workers were exposed while engaged in relief activities. Since living outside contaminated zones on a regular basis was often not feasible, calculations suggest that many aid workers may have received radiation doses exceeding the annual limit of one millisievert.

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[1] State of Damage Caused by the Earthquake and Tsunami Fukushima Reconstruction Information Portal Site, https://www.pref.fukushima.lg.jp/site/portal/hinansya.html , accessed February 25, 2025.

[2] “Fukushima Today: Recovery from the Earthquake and Nuclear Accident.” Fukushima City Official Website. (https://www.city.fukushima.fukushima.jp/seisaku-chousei-sougou/hukko.html)Accessed February 25, 2025.

Because individual aid workers may already have been exposed to varying levels of radiation prior to deployment, and because radiation levels at their places of residence during the assignment also differ, it is possible for a worker to exceed the exposure limit even if their recorded dose during working hours does not reach the threshold. Organizations must therefore take such factors into account and ensure appropriate measures—such as rotating staff or providing rest periods—so that no individual is placed at undue risk.

In the event of a nuclear disaster, it is necessary not only to implement the usual safety measures for personnel involved in relief operations but also to make additional preparations for the mobilization and deployment of supplementary aid workers and volunteers.

Minimum Standards

1. Aid/relief organizations that may be called upon during a nuclear disaster should make use of non-disaster times to establish clear policies, especially with regard to personnel, secure the necessary resources, and provide systems and training
2. Supporters and volunteers, as well as the organizations that mobilize and dispatch them, must understand the peculiarities of radiation and the risks of exposure.
3. The radiation exposure of supporters and volunteers during relief activities should be recorded regularly, managed appropriately, and supported through measures such as rotation and reassurance.

Key Actions

Organizational Provisions for Aid Workers and Volunteers

1. Support Policies, Activities, and Structures for Nuclear Disasters

Support organizations such as NPOs and NGOs should review their own mission statements when considering their policies, activities, and organizational structures for responding to a nuclear disaster. This reflection should also take into account role-sharing and complementarity with other support organizations. In the event of a nuclear disaster, specialized groups including police, fire services, and military forces will be dispatched in line with government and administrative response plans. These groups are equipped with trained personnel and the necessary tools and resources, so it is important to clarify the division of roles between them and civilian support organizations.

2. Setting upper limits for radiation exposure as an organisation

It is difficult to draw a clear line for the annual exposure limit for the general public, but many governments have adopted the ICRP's[3] recommended public exposure limit of 1 mSv/y[4] (0.23 μSv/h).This is a controversial figure as there is no threshold value, but generally speaking, lower radiation exposure levels are preferable. For this reason, the Japanese Red Cross Society set the maximum annual radiation exposure limit for its volunteers at 1 mSv after the Fukushima nuclear accident, which is an important example. For more details, please refer to Chapter 1 of Part 1.

3. Promoting Basic Understanding and Awareness of Radiation

For most of us, radiation around us comes from two main sources: natural background exposure[5] and medical X-rays. Since hospitals post "No Entry" signs around X-ray rooms, we know that radiation is dangerous, but most of us have no idea how to protect ourselves from it. That is why aid workers and volunteers, as well as the organizations that dispatch them, need to ensure, either on a regular basis or at the time of deployment, that the latest knowledge about radiation risks is shared and understood by all personnel. For details on radiation risks, see Part I, Chapter 1.

4. Awareness of high risk groups

It is important to recognize that certain groups such as children and adolescents, women who

[3] Refer to the glossary page.

[4] 1 millisievert per year: According to the 2007 ICRP recommendations, the effective dose limit for occupational workers engaged in radiation work, excluding emergency situations, is 100 millisieverts over five years, with no more than 50 millisieverts in any single year.

[5] Natural exposure: According to the Ministry of the Environment, the annual average exposure from natural sources is 2.4 millisieverts worldwide and 2.1 millisieverts in Japan.
Source: https://www.env.go.jp/chemi/rhm/kisoshiryo/attach/201510mat1s-01-6.pdf

may become pregnant, pregnant women, and breastfeeding mothers may face a higher risk of health problems caused by radiation exposure.

5. Preparation of stable iodine tablets

In municipalities near nuclear power plants in Japan, stable iodine tablets are distributed to residents so that they can be taken immediately after a nuclear disaster to reduce internal exposure of the thyroid to radioactive iodine. However, during the nuclear disaster caused by the Great East Japan Earthquake of March 11, most regions did not distribute or administer them. Support workers and volunteers entering the affected areas may also be required to take them, so advance preparation is necessary. For further details, see Part 1, Chapter 1.

6. The importance of spare clothing, cleaning, and safe water and food

People exposed to radiation are not contagious in the way infectious diseases are, so there is no scientific or medical risk of transmitting radiation to others. However, in disaster areas, mud, debris, and other materials may carry radioactive substances attached to shoe soles, vehicle tires, clothing, or hair. These substances can spread to other people or places, creating further exposure risks. When entering such areas, proper protective measures are required, and upon returning it is essential not only to dispose of protective gear but also to change clothes and carry out thorough cleaning and washing. As noted in Part 1, Chapter 1, exposure can occur externally or internally. Therefore, it is vital to ensure that support workers, volunteers, and residents have access to safe water and food that are free from contamination.

7. Preparation and provision of basic knowledge about nuclear disasters

During non-disaster times, it is useful to prepare websites and documents that explain the basics of radiation, the nature of nuclear disasters, and the fundamentals of disaster support. Making this information known in advance enables a quicker response when such a disaster occurs.

8. Building networks in non-disaster settings

Establishing networks in advance with local governments and electric power companies that respond to nuclear disasters, as well as universities, hospitals, support and volunteer organizations, and local social welfare groups, enables quick and effective responses when a nuclear disaster occurs.

9. Regular recording of radiation exposure and rotation system for supporters and volunteers

Since views on acceptable radiation exposure limits vary among individuals, it is important to respect the personal perspectives of supporters and volunteers. Within the upper limits set by the organization, individuals should be able to decide whether to participate, as well as the duration of their involvement, and should also have the option to revise these decisions during the course of activities. At the same time, to ensure the continuation of support, it is desirable to establish a system that allows personnel to be rotated and dispatched in succession.

10. Voluntary monitoring of radiation levels and corresponding actions

While the readings from monitoring posts installed and published by the government and other authorities can serve as a reference, it is important to conduct independent and continuous measurements of ambient radiation levels at the activity site. If the measured levels exceed the established threshold, appropriate actions such as suspending support activities or evacuating should be taken. It should also be noted that radiation levels vary depending on the measurement height (for example, 50 cm, 1 m, or 1.5 m above the ground) and are constantly affected by factors such as weather, wind direction, wind speed, and the arrival of new radioactive materials.

11. Measurement and recording of individual radiation exposure doses, information sharing, and response measures

There is a need to establish a system for the distribution and collection of personal dosimeters, such as glass badges, and for the prompt sharing of measurement results between the organisation and the individual, so that appropriate measures can be taken.

12. Provision and use of protective equipment

Exposure should be minimized through the proper use of protective equipment such as masks. However, it is equally important to remain alert to potential health issues caused by their use, such as heatstroke. In addition, advance procurement and administration of stable iodine tablets should be carried out in coordination with relevant expert institutions.

13. Relief based on humanitarian principles

Even in the event of a nuclear disaster, support shall be provided based on the principles of humanity, impartiality, neutrality, and independence. Even if support organisations, supporters, or individual volunteers have religious beliefs, they shall refrain from any actions or displays that could be construed as propaganda or proselytising.

Guidance Note: Lessons from Fukushima

The following is an example of equipment and precautions that NGOs planning to respond to nuclear disasters should prepare in advance and become familiar with in order to minimise radiation exposure to supporters and volunteers they mobilise.

No	Name	Explanation	Other
①	Spatial Radiation Measuring Device	For workers to measure and record the ambient radiation levels at the activity site themselves	Geiger counters, NaI(Tl) scintillation survey meters, monitoring posts installed by the government in various locations after the accident, etc.
②	External radiation exposure meter	Measure radiation levels on surfaces and specific areas.	GM survey meter, etc.
③	Personal dosimeter	To measure the cumulative exposure of each individual	In Fukushima, 'glass badges' were widely used, but the radiation exposure dose was unknown until the data was returned from the inspection agency. Some devices immediately display the dose at that point in time and the cumulative dose for the day. It is also essential to collect and monitor this data on a daily basis.
④	Protective Equipment	Potassium iodide tablets, nonwoven water-resistant protective suits, masks, gloves, goggles, and hats.	Wearing a mask to prevent inhalation of dust from contaminated soil is essential. An N95 mask is suitable, but it is often uncomfortable to breathe through and may be difficult to obtain. In such cases, other types of masks should be used.
⑤	Change of clothes and cleaning or decontamination tools	A change of clothes and cleaning or decontamination tools to prevent the spread of radiation to the outside	To prevent radioactive material from being brought indoors, wear raincoats and boots that cover your body extensively when going outside, and do not bring them indoors.
⑥	Rest areas, water fountains, and restrooms	For the changing, cleaning, sanitation, and rest of supporters and volunteers	
⑦	Safe water, ORS (oral rehydration solution), and food	Prevention of dehydration and internal radiation exposure	
⑧	Vehicles・Parking lots・Fuel	For transporting supporters and volunteers	When returning from the site, wash the vehicle body and tires.

(Masaaki Ohashi)

Chapter 2 Key Considerations for Providing Evacuation Support (Advance Preparations)

The complexities arising from variations in evacuation origin zones

In relief settings during a nuclear disaster, information about radioactive contamination is likely to become confused and contradictory. According to the Nuclear Disaster Response Guidelines[1] formulated by the Japanese government, the responsibility for deciding who should evacuate, to where, when, and how lies with the authorities. However, in the urgent circumstances of a nuclear disaster, much is left to the judgment of people on the ground. Aid workers must plan their activities while weighing both the risks of evacuation and the risks associated with providing support. Decisions are also required within each support organization regarding what kind of assistance to provide and how to deliver it. Experience in Fukushima showed that evacuees included both forced evacuees—residents living within designated evacuation zones who left in compliance with government orders—and voluntary evacuees—residents living outside those zones who chose to evacuate on their own. The distinction between these groups affected the type of official reception systems available and the kinds of support they could receive. This highlighted the importance of making careful decisions that take such differences into account.

Minimum Standards

1. Relief/aid workers aim to provide assistance that minimizes risks and disadvantages for evacuees.
2. Relief should be provided to all people, regardless of whether they are forced evacuees or voluntary evacuees, and it should be tailored to individual needs to ensure that no disparities arise in the outcomes of assistance.

Key Actions

1. In a nuclear disaster, relief/aid workers must always prioritize their own safety. Even if no official evacuation order has been issued, if there is a risk of danger they should follow their organization's rules and decide whether to continue or stop their activities. Organizations should also share the information they have with partners — including NGOs, government agencies, and other responsible staff — so that decisions in the field can be based on the best available knowledge.
   (1) Residents and support groups in areas with nuclear power plants should obtain the evacuation plans formulated by their local governments during ordinary times. This empowers individuals in considering what evacuation routes are available to them.
   (2) During operations, actively provide information held by the affiliated organization (such as wind direction and appropriate evacuation routes) to support partners (NPOs/NGOs, government agencies and related organizations, their responsible officers, safety personnel, etc.).
   (3) Confirm the presence of individuals who have not received evacuation instructions from the government, such as foreigners, the elderly, and persons with disabilities, and implement information sharing among government agencies.
   (4) Residents and support groups in areas with nuclear power plants should confirm meeting places and communication methods with family members and colleagues living in the area.
   (5) Evacuation due to nuclear disasters may involve prolonged periods and repeated long-distance travel. Therefore, carefully consider the contents of items to carry during evacuation (or when providing relief). In particular, always keep vehicle fuel tanks nearly full, or confirm refueling methods in advance.

2. Support organizations shall prepare equipment, establish procedures for actions, and implement radiation exposure dose recording protocols to minimize external and internal exposure for their own volunteers. (Refer to the previous chapter, "Preparations for Mobilizing and Dispatching Supporters and Volunteers").

[1] A document that sets out the basic principles and response procedures to protect residents' safety in the event of a nuclear disaster. Revised September 11, 2024.

3. Medical and welfare facilities must prepare wide-area evacuation plans and reciprocal intake arrangements so that severely ill patients, elderly people, those requiring care, and others whose conditions could worsen through evacuation can still be moved to nearby areas and continue treatment, regardless of whether the location is designated as an evacuation zone. Support organizations should assist to ensure these processes run smoothly.
   (1) Medical and welfare facilities should establish agreements with a wide range of nearby medical and welfare facilities (including those capable of providing radiation exposure treatment) and institutions in the disaster-impacted area. They should also ascertain the number of patients each facility can accept and the symptoms they can treat.
   (2) Medical and welfare facilities shall establish evacuation priority levels (e.g., elderly, persons with disabilities, pregnant women, young children) in collaboration with local governments to develop efficient evacuation support plans. They shall establish the shortest and safest evacuation routes and update them regularly. Multiple evacuation routes shall be designated, with travel times and road conditions assessed in advance.
   (3) Medical and welfare facilities shall categorize users based on their support needs and levels, create individual evacuation plans with the consent of the individuals and their families, and update them regularly.
   (4) Secure appropriate transportation vehicles (including ambulances, welfare vehicles, fuel, and driver arrangements) tailored to each individual's condition. Measures must be taken to ensure passage for life-saving medical interventions during emergency movement restrictions or road closures.

4. Ensure assistance that prevents evacuees from suffering disadvantages due to voluntary evacuation, mandatory evacuation, or differences in evacuation timing.
   (1) Confirm the legal basis for the compensation system covering all evacuees, including those outside designated evacuation zones. Support evacuees in receiving public assistance commensurate with their individual circumstances for their evacuation.
   (2) Relief organizations in areas with nuclear power plants can assist local governments in advancing comprehensive livelihood support, including prompt assistance with evacuation-related expenses (transportation, lodging, living costs, etc.) and housing support for evacuees facing long-term displacement. They can also support the formulation of relief plans that incorporate compensation for income losses due to evacuation.
   (3) Establish a seamless intake system through collaboration with host municipalities, providing employment support for evacuees, educational support for children, and health support including psychological care.
   (4) To ensure transparency and fairness, ask that the criteria for public support be clarified and made public.

Guidance Note: Lessons from Fukushima

Precautions Regarding the Spread of Radioactive Contamination

Radioactive dust and fine particles can form radioactive plumes that are carried by the wind and brought down by rain. Relief efforts must take into account wind direction, weather, and terrain, as these factors influence the spread of contamination and the creation of hotspots. Evacuation routes must be planned with these risks in mind. Since wind direction can change, frequent information gathering and flexible support for evacuation movements are essential.

Delay in Establishing Evacuation Zones

In the initial stage, the Planned Evacuation Zone was set too narrowly and then expanded in phases. This created a serious gap between the actual contamination levels and the designated evacuation areas. As a result, evacuation orders were delayed, and many residents were exposed to radiation. In future nuclear emergencies, similar gaps between contamination and evacuation zones may occur. Relief actors must therefore urge the relevant authorities to consider the implementation of wide-area evacuation from the earliest stage as a precautionary measure.

Impact on Medical Institutions

When evacuation orders are delayed, the transfer of critically ill patients from hospitals becomes extremely difficult. In such cases, backup power may fail, leading to the loss of life-sustaining equipment such as ventilators. For patients who require constant medical care, preparations for wide-area evacuation must be made at an early stage. Relief actors working externally should confirm whether the target medical and welfare facilities have prior agreements with facilities in neighboring prefectures.

Evacuation planning for medical institutions, patient transfer systems, and the securing of receiving facilities must be established before an accident occurs, with regular training conducted in advance. Relief organizations operating in areas where nuclear power plants are located should be fully aware of these plans and arrangements.

Support Systems for Voluntary Evacuation

Government support for “voluntary evacuees,” who evacuated from areas outside the designated “planned evacuation zones,” was limited. However, among these voluntary evacuees were households with young children and individuals who chose to evacuate due to concerns about radiation. The necessity of evacuation cannot be determined solely based on residential location. Both voluntary and planned evacuations should be recognized as important and valid measures.

Regarding livelihood reconstruction, residents within designated evacuation zones received support such as housing assistance and living expenses. In contrast, voluntary evacuees often lacked eligibility for temporary housing and faced difficulties securing rental accommodations, employment, and other essentials, leading to the disruption of their livelihoods. Relief planning and implementation should be guided by the needs of evacuees, regardless of their zone of origin. Effective relief must address the protection of life, the safeguarding of livelihoods, and the preservation of community, ensuring that assistance is tailored to the actual conditions and needs of those affected.

(Takeshi Komino)

Chapter 3 Supporting the Operation of Evacuation Centres (Emergency Assistance)

Diverse needs far exceeding those of natural disasters

In the case of natural disasters, rapid and appropriate evacuation is extremely difficult unless a community has undergone exceptional levels of preparedness and training. Common barriers include lack of accurate information on emerging risks and safe zones, failure to transmit evacuation instructions to residents, shortage of personnel skilled in shelter management, and inadequate stockpiles at evacuation facilities. Under a nuclear disaster, these pitfalls are compounded by the fundamental need to protect against dispersed radioactive materials. As a result, confusion and disruption are expected to far exceed those seen in natural disasters. Relief organizations and responders must therefore undertake more thorough preparation and operate with a long-term perspective to ensure effective evacuation and sheltering operations.

During the Fukushima nuclear disaster, many residents were forced to evacuate under extreme uncertainty. They faced a constellation of serious concerns, including a lack of reliable information on radioactive fallout, anxiety over exposure during evacuation or while sheltering, and doubts about the accuracy and adequacy of evacuation orders. Often leaving with only the clothes on their backs, people were moved tens of kilometers away to shelters by emergency buses or private vehicles.

Upon arrival, many evacuees encountered overcrowded or unsafe conditions, requiring them to relocate two or three times, frequently being separated from family members or community groups in the process. Because the affected (contaminated) area was so vast and the number of evacuees so large, some groups were eventually accommodated in convention centers and other large-scale facilities.

As a result, large numbers of evacuees—men and women of all ages from diverse communities—were forced to take shelter together in large-scale facilities that were inadequately prepared for disaster conditions. While the protection of evacuees' basic needs such as food, shelter, clothing, and the safeguarding of dignity and human rights can parallel that of natural disaster contexts, nuclear emergencies demand additional, distinctive considerations. This chapter, drawing on lessons from Fukushima, sets out the minimum standards and key considerations for relief actors in supporting the establishment and management of evacuation centers by public authorities under nuclear disaster conditions. Welfare shelters are not addressed in this section.

Minimum Standards

Provide operational relief conducive to humane living conditions in shelters.

1. Ensure the health of all evacuees.
2. Ensure all evacuees have access to diginified living environment.
3. Fostering an environment for a fulfilling everyday life with dignity and autonomy.
4. Provide information to help evacuees rebuild their lives.

Key Actions

1. Flexible Evacuation Measures with Life Saving as the Highest Priority

In Fukushima, the number of disaster-related deaths (excluding direct deaths) under nuclear emergency conditions was overwhelmingly higher than in the other two Tohoku prefectures (Fukushima: 2,343; Miyagi: 932; Iwate: 471[1]). Evacuation under nuclear disaster circumstances imposed extreme physical and psychological burdens: fears of radiation exposure, long-distance relocations in search of safer areas, and repeated displacements (up to 48 times[2] in Fukushima) contributed heavily to the toll. Elderly individuals, those with chronic illnesses, and persons with disabilities have historically experienced disproportionately high rates of disaster-related deaths during evacuations following natural disasters. The level of fatigue experienced by disaster-vulnerable individuals is particularly immense. For relief actors, ensuring that lives already saved from the initial disaster are safeguarded

[1] Number of deaths related to the Great East Japan Earthquake Disaster (as of December 31, 2023). Reconstruction Agency, "Reconstruction and Revitalization: Beyond" (March 1, 2024)

[2] Fukushima University Disaster Recovery Research Institute (ed.), "Fiscal Year 2011 Futaba 8 Municipalities Disaster Restoration Actual Conditions Survey: Basic Statistical Report"

throughout the evacuation process must remain the paramount priority.

2.To maintain the physical and mental health of evacuees, establish systems for managing evacuees information, gathering needs assessments, and providing ongoing support.

Life in evacuation shelters tends to become prolonged. Factors contributing to this include the difficulty of constructing temporary housing or reconstruction housing in disaster-affected areas, requiring time to secure land, as well as the time needed for evacuees who have been displaced over a wide area to decide whether to relocate to their evacuation destination or return to areas near the disaster zone. To maintain physical and mental health during prolonged shelter stays, it is essential to establish shelter environments that protect the lives saved in the medium term. This includes gathering information on evacuees and their needs, establishing monitoring systems, and defining evacuation routes in case of fires or disasters occurring during the evacuation period.

3.Establishing Human Security: Ensuring a Decent Life for All Evacuees

In the initial phase of evacuation, shelters are often marked by severe shortages of supplies, infrastructure, and personnel, resulting in conditions that barely sustain life. From this starting point, relief must prioritize the progressive restoration of human dignity through improvements in basic living environments—such as sanitation, bathing facilities, and sleeping arrangements. Particular attention must also be paid to those whose needs are frequently marginalized in shelters: the elderly, persons with disabilities, women, children, people with foreign roots, pet owners, and tourists. Relief measures should therefore incorporate special care for vulnerable groups as well as explicit mechanisms for Protection from Sexual Exploitation, Abuse, and Harassment (PSEAH).

4. Supporting Environments of Dignity, Autonomy, and Meaningful Living

Prolonged reliance on relief risks eroding evacuees' vitality, dignity, and sense of purpose. Once a basic standard of living has been secured, relief actors must shift toward approaches that encourage self-initiative and uphold human rights. Once a certain level of living environment has been established, it is necessary to promote the autonomous activities of evacuees in accordance with human rights principles, while providing support for opportunities for interaction and community building. This means supporting activities that enable evacuees themselves to take the lead in improving their living environment and rebuilding their community, so they can regain their daily lives.

5. Installation of bulletin boards, community radio (FM), etc.

Long-term evacuation shelters serve as crucial spaces where evacuees can develop blueprints for rebuilding their lives. However, during evacuation, their range of movement becomes restricted, making access to media and other sources of information difficult, leading to information shortages. Supporters must prioritize providing information to help clarify the path forward for evacuees' lives after evacuation. Utilize bulletin boards, community FM radio, and other means to actively and continuously provide timely and accurate information.

Guidance Note：Lessons from Fukushima

For detailed guidance on shelter planning and allocation of living space, reference should be made to the Sphere Handbook, section "Shelter and Settlement.[3]" In this chapter, the focus is placed on fundamental actions specific to nuclear emergencies, particularly those informed by practices during the Fukushima disaster.

Prioritized Action Checklist for Core Practices

1. First, keep in mind a flexible approach that prioritizes protecting the lives of evacuees.

Prerequisite: Establish evacuation shelters in areas with low radiation exposure risk.

(1) Life-critical issues

A. Identifying evacuees showing signs of illness and providing emergency care, coordinating with healthcare facilities

B. Confirmation of potential secondary disasters at evacuation facilities(securing emergency

[3] Sphere (2019). The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response. Japanese Edition, 4th Edition.

evacuation routes) and emergency response
C. Securing drinking water
D. Provision of toilets
E. Research and consideration of safer evacuation sites (multi-purpose facilities, gymnasiums, hotels, etc.)

2. Establishment of systems for managing evacuees information, identifying needs, and providing oversight to maintain the physical and mental health of evacuees
(1) Matters related to maintaining health
A. Ensure sleeping space (e.g., cardboard bed with a height of at least 30 cm above the floor)
B. Measures in the event of an infectious disease outbreak (securing a treatment site where contact with non-infected individuals is avoided)
(2) Confirmation of lifelines for preparing the establishment and operation of evacuation centers
A. Verification of emergency shelter supplies
B. Organization and request for life-sustaining supplies and support (EpiPens[4], allergy medications, etc.)
C. Establishment of shelter management policies, support cycle, and responsibilities
(3) Capturing, managing, and sharing information (evacuee lists, attributes including specific needs, evacuees safety status information, support information, etc.)
A. Distribution and management of food and supplies
B. Establishment and operation of consultation services for evacuees (support for rebuilding lives, including next destination, medical care, employment, etc.)

3. Establish an environment where all evacuees can lead a "decent life" (human security[5])
(1) Improvement of sleeping and living environments (ensuring privacy and safety)
(2) Health management of evacuees (including measures against potential outbreaks of infectious diseases)
(3) Establishment and maintenance of a hygienic environment
(4) Provision of bathing opportunities
(5) Needs assessment, monitoring activities, and responsive action
(6) Support for individuals requiring special consideration (including consideration for women based on the PSEAH[6] perspective mentioned above, individuals whose need for support is not fully clear (those on the borderline, children), the elderly, children, foreign residents, individuals with allergies, etc., provision of dedicated spaces, etc.)
(7) Care for pets and pet owners (designated areas and arrangements for co-sheltering where possible)
(8) Security and crime-prevention measures

4. Supporting an environment for a "meaningful life" with dignity and autonomy
(1) Establishing gathering places and social salons to promote communication among evacuees and local residents
(2) Consultations and preparations for establishing self-governance functions (supporting evacuees with an emphasis on fostering autonomy and restoring connections to their hometowns)
- Establishing self-governance mechanisms for evacuee communities
- Facilitating evacuee-driven activities (such as cultural or communal events)

(3) Temporary return home assistance for evacuees
In Fukushima, the government established criteria for who could temporarily return home and when, but those who did not receive the information or lacked transportation could miss their chance to return.

5. Install bulletin boards and community radio (FM) within the evacuation shelters to actively provide timely and accurate information continually.
(1) Minimum Required Information
Initially, use whiteboards or bulletin boards to display essential information (radiation levels,

[4] Refer to Glossary page
[5] Refer to Glossary page
[6] Refer to Glossary page

shelter rules, available services, etc.) in prominent locations such as the entrance of the shelter.

(2) Important information is disseminated via announcements within the facilities

(3) Ensure the provision of conversation areas and other spaces to enable evacuees to access media such as television.

(4) Consider introducing media that enable disaster victims to share their own messages, such as community FM radio stations, to provide diverse information.

(5) Establishment of communication environments such as the Internet and smartphones

(6) Ensuring multilingual communication (posters, interpretation, etc.)

(Kazuhiko Amano, Tsuyoshi Ikeza)

Column: Unique Circumstances Experienced by Evacuees during Nuclear Emergencies

Evacuees and supporters faced many factors distinct from those encountered during natural disasters, all while navigating unseen radiation risks. This experience merits recording here.

<Emergency Evacuation>

○The number of survivors/evacuees tends to be significantly larger than in natural disasters (due to the wide geographic impact and the need to establish shelters outside the designated evacuation zones).

○Evacuation destinations are often at considerable distances (residents within the 30 km UPZ—Urgent Protective Action Planning Zone[7] —are instructed to retreat, and even residents outside the 30 km zone, fearing contamination, often evacuate voluntarily to remote areas despite the lack of institutional relief).

○Large-scale shelters under administrative management capable of accommodating large numbers of people must be established and operated (often exceeding their intended capacity).

○Due to shelter capacity limits, not all residents from the same affected community are able to remain together throughout the evacuation.

○Evacuees are frequently required to relocate multiple times before settling in a final shelter.

<Evacuation Shelters>

○By the time evacuees arrive at shelters, their physical and psychological distress is already greater than in the case of typical natural disasters.

○Evacuees from different regions are likely to be mixed together in a single evacuation center.

○People in the same area are separated from family, acquaintances, and friends while living in evacuation shelters.

○Reuniting with separated family members, friends, and acquaintances is difficult, as evacuees are frequently transferred between shelters.

○Because the evacuation site is located in another municipality, existing self-help functions within the displaced community (such as neighborhood meeting halls and community centers) cannot be utilized. New community-building becomes necessary.

○Since community ties have already collapsed from the initial stage of evacuation, evacuees are more vulnerable to isolation, loneliness, social withdrawal, physical inactivity, and lack of information.

○Evacuees must navigate daily life, temporary returns, and the process of rebuilding while continuously contending with the long-term risks of radiation exposure

<Other Considerations>

Examples of Specialized Relief Measures

○Measures to reduce radiation exposure risks within evacuation shelters (such as proper use of masks or protective clothing when going outdoors).

○Securing and displaying information sources (e.g., SPEEDI[8]) that identify radiation-contaminated areas, in order to support preparation for temporary return and ensure evacuees' safety.

○Physical and mental health care in response to potential radiation exposure (including provision of risk-related information, medical checkups, and psychological support).

[7] Refer to Glossary page

[8] Refer to Glossary page

Chapter 4 Support for Disaster-Affected Communities
(Emergency Assistance/Long-Term Relief)

Challenges at evacuation origins, destinations, and surrounding areas

In natural disasters, damage is visible—collapsed or half-destroyed homes, flooding, and other tangible signs. By contrast, in nuclear disasters, the extent of harm is "imperceptible to the five senses" (Japanese Red Cross Society, Guidelines for Relief Activities in Nuclear Disasters; hereinafter, the "Japanese Red Cross Guidelines"[1]). Radiation risks are further obscured by divergent scientific evidence and standards among experts, differences in institutional positions, and the varied understandings and judgments of individuals. As a result, neither survivors nor relief workers can fully grasp the scale of impact, creating conditions for strain and division within households, daily life, and communities. Survivors face the challenge of community reconstruction shaped by divergent pathways—some returning in line with policies, radiation levels, or economic activity, while others rebuild new lives in places of evacuation.

The Red Cross Guidelines set out in detail the considerations that supporters must bear in mind regarding the circumstances faced by affected communities. In some municipalities, the entire population was forced to evacuate by the nuclear disaster. With residents deprived of every aspect of daily life and communities themselves at risk of collapse and fragmentation, it is necessary to examine how supporters should respond.

◇ **Perspectives on Community Support**

In the case of a nuclear disaster, the government and other authorities may designate extensive and long-term restricted areas prohibiting general access, resulting in large numbers of evacuees who are often compelled to live in remote locations. Compared with other types of disasters, the burden of evacuation life is greater for those affected, due to unfamiliar living environments, the challenges of resettling in new locations, building new relationships, and the damage caused by harmful rumours or misinformation. (p.4)

When evacuation destinations extend across wide areas, distance constraints weaken the functions of local communities, reducing mutual support and watchfulness that previously existed in the community. (p.4)

Community fragmentation may worsen the isolation of disaster-affected individuals, raising concerns that it could impede stress alleviation and recovery. (p.6)

Evacuation is expected to take place in order to avoid the effects of radiation, either to areas with relatively lower radiation levels or outside the disaster-affected area. (p.18)

Due to the particular characteristics of a nuclear disaster, difficulties may be amplified especially in the recognition of information, matters related to movement (evacuation), actions necessary to sustain life as evacuees, and adaptation to the environment. (p.5)

(From Japan Red Cross Guidelines)

Ⅰ. Engagement with Affected Communities

Minimum Standards

Relief must take into account the disparities in public assistance and compensation that arise not only from distance to the nuclear accident site but also from radiation damage unevenly distributed by natural conditions such as wind direction. It must also detect and address the tensions and divisions among communities caused by ambiguities in scientific evidence and inconsistencies in standards. At the same time, relief should respect the diverse needs of each individual while helping to restore community functions.

[1] Japanese Red Cross Society, Guidelines for Relief Activities in Nuclear Disasters (November 2018 edition). 2018.

Key Actions

1. Relief should be carried out with communities in the driving seat, taking into account the disparities in public assistance and compensation based on the level of radiation damage, as well as the resulting tensions, divisions, and ruptures within communities.
2. Comprehensive initiatives should be implemented that encompass communities facing division, fragmentation, and conflict, with the aim of achieving localization.
3. Relief should ensure that the diverse decisions of individuals are respected.
4. Relief should be provided to compensate for the loss of mutual support and watchfulness that once existed in the community.

Guidance Note: Lessons from Fukushima

Outside the designated evacuation zones, factors such as voluntary evacuation, zoning based on distance from the accident site, and differences in area classifications created disparities in relief payments and compensation. These disparities, in turn, fueled tensions and fragmentation within communities. In specific evacuation recommendation zones and among voluntary evacuees, differing perceptions and attitudes toward radioactive contamination led to friction, breakdowns, and ruptures within families and communities when decisions about whether to evacuate had to be made. In areas outside the designated zones, evacuees were sometimes stigmatized as having abandoned their land, while along zoning boundaries, neighbors faced unequal evacuation orders, resulting in discrimination in the distribution of compensation and relief payments.

As part of relief efforts to address such circumstances, a raft of initiatives were undertaken. One approach was the establishment of “salons” in public spaces such as shopping malls, where disaster-affected individuals from different backgrounds and local residents could come and go freely, with events organized to foster interaction. Another approach, often near municipal facilities, was to hold separate gatherings and events: some for evacuees grouped by place of origin, and others for evacuees living in host communities. These separate gatherings were later combined into integrated events, which sought to mitigate tensions, divisions, and conflicts between communities.

The establishment of such salons was influenced not only by the needs of evacuees but also by the particular circumstances of host communities that, despite being disaster-affected themselves, were required to receive evacuees. In some cases, spaces for constructive dialogue were created that transcended individual viewpoints, providing opportunities to foster mutual understanding and to ease tensions, divisions, and conflicts.

Efforts were also made to compile relevant objective information, and through activities such as site visits and study tours, mutual understanding was deepened and new connections were formed. At the same time, there were many cases in which relief did not adequately reach certain groups, including people with foreign roots and disaster-affected or evacuated individuals who remained in their homes.

Ⅱ. Community Maintenance, Re-formation, and Sustainability — With Consideration for Children and Parents

> Evacuees face both the physical burden and psychological stress of leaving their original communities and participating in new communities at their evacuation sites. (Red Cross Guidelines, p.18)

Under nuclear disaster conditions, relief efforts that support the maintenance and re-formation of communities at evacuation sites become essential. In some designated evacuation areas, disparities in evacuation planning have resulted in evacuees being scattered across the country, and in some cases, evacuees are forced to move repeatedly from one location to another. Under such circumstances, activities aimed at re-forming original communities within each evacuation area are necessary.

It is also important to recognize that the anxiety and stress experienced by children may have

long-term effects on their lives, often differing from those experienced by adults. Likewise, attention must be given to the anxieties and concerns faced by parents.

> In addition to the anxiety and stress that children themselves feel, concerns have also been raised about the psychological impact they receive from family members and other adults.
> For this reason, opportunities are needed both for relieving children's stress and for enabling them to engage in forward-looking activities that allow them to think about their own future. (Red Cross Guidelines, p.19)
>
> Research has also revealed that some children require mental health support as a result of earthquake-related impacts.
> However, in practice, only about half of the reported cases have actually been connected to support through school counselors or medical institutions.
> Relief must therefore be considered with attention to changes in living environments, such as the shift from prolonged evacuation to return and rebuilding of daily life, as well as to the mental health of parents.
> (Study on Awareness and Support for Developmental Disabilities in Fukushima Prefecture, p.9)[2]

Minimum Standards

Engage in the re-formation of communities at evacuation sites with due regard for the identity and autonomy of the communities to which disaster-affected people belong.

When supporting the re-formation of communities to which return becomes possible after evacuation orders are lifted, particular attention should be paid to the circumstances of older persons and households with children.

Key Actions

1. Provide relief to ensure that the re-formation of communities at evacuation sites is community-led and participatory. Particular attention should be given to situations in which evacuees are scattered across different locations or forced to move repeatedly, so that community re-formation can proceed in a way that helps preserve the collective identity of the disaster-affected population.

2. Taking into account the prolonged nature of evacuation relief should support sufficient, participatory consideration of options such as temporary town initiatives, community formation outside the original town, and second-town initiatives[3].

3. When evacuation orders are lifted, relief for the re-formation of return communities should be provided with particular consideration for older persons, who often play a central role in return, as well as for children who may be separated from their families depending on household decisions.

Guidance Note: Lessons from Fukushima

In Fukushima, some residents who initially evacuated later became scattered across the country, from Hokkaido in the north to Okinawa in the south.[4] In many cases, families had no choice but to

[2] "Study on Awareness and Support for Developmental Disabilities in Fukushima Prefecture" (Iwaki City), p.162, 2015 Principal Investigator: Hideo Honda (Department of Child and Adolescent Developmental Psychiatry, Faculty of Medicine, Shinshu University) Co-Investigator: Tokio Uchiyama (Professor, Faculty of Human Studies, Taisho University) Research Collaborator: Keiko Kawashima (Researcher, Office for Promotion of Child Mental Health Support Projects, Fukushima University)

[3] The host community refers to residents living in an area prior to the arrival of evacuees. A second town denotes a new settlement created by those unable to return home. The concepts of extra-municipal community formation and the so-called "provisional town" were intended to provide stable living bases for long-term evacuees; in practice, the latter sought to reunite dispersed residents (e.g., Futaba Town). Because the term "provisional town" caused frequent misunderstanding, the Reconstruction Agency now standardizes the usage to "extra-municipal community."

[4] Fukushima Collaborative Recovery Center Archive Editorial Committee (ed.). Ten Years of FUKUSHIMA: Fifty Stories of Civic Groups Confronting the Earthquake and Nuclear Disaster. Fukushima Collaborative Recovery Center, 2021. Refer to the case of the community-building NPO Shinmachi Namie, pp.129–134.

split up when deciding on evacuation destinations, leaving lasting scars on the family unit—the most basic form of community. Amid these circumstances, there were also efforts to sustain identity and foster new ties outside the original towns, such as organizing festivals that served as a foundation for community formation among evacuees dispersed nationwide.

For example, in Kawauchi Village, Fukushima Prefecture, the organization Kawauchi Community Project implemented the program "Furusato School," in which older persons recounted tales of their hometown with children in order to give them hope. This initiative contributed to community re-formation by providing a sense of purpose and preventing isolation among elderly evacuees, while also focusing on mental health care for children under nuclear disaster conditions.

In parallel, concepts such as provisional town initiatives outside the original districts, the formation of communities beyond the towns of origin, and the establishment of second towns were also proposed. In some cases, repeated resident workshops were held to explore these possibilities; however, they were not realized, and thus require further development as a framework for future relief.

Ⅲ. Host Communities in Wide-Area Evacuation

Minimum Standards

Engage with host communities in ways that take into account the stress caused by the sudden population increase resulting from the large influx of evacuees.

Key Actions

1. Provide host community supporters with opportunities for psychosocial support, mental health care, and the development of communication skills.

2. Neutral intermediary or third-party organizations should provide forums where host communities can share their circumstances and perspectives—through dialogue, mutual support, information exchange, and the provision of relevant resources.

Guidance Note：Lessons from Fukushima

The lack of timely information sharing between municipalities of origin and host municipalities often delayed efforts to address community issues. In host communities, some residents experienced increased stress, as they were unable to evacuate themselves and received no support or compensation, yet were still expected to welcome and assist evacuees.

In some cases, host communities were unable to bear the substantial burden of accommodating evacuees. The sudden influx of residents, often arriving simultaneously from multiple municipalities, created the pressures typically associated with rapid population expansion. Host communities themselves became fatigued, at times responding with heightened sensitivity to the conduct of evacuees or to the modalities of support extended to them. Complaints surfaced regarding increased traffic congestion, longer queues in supermarkets, and the use of public facilities such as waste-disposal sites and community halls. To mitigate such tensions, workshops and "future conferences" were convened, providing structured fora for constructive, forward-looking dialogue and reciprocal information-sharing between evacuee and host communities.[5]

To safeguard the physical and mental well-being of host communities and those engaged in support activities within affected areas, it is essential to provide not only immediate psychological care, including information sharing, advance communication, attentive listening, and counseling, during the emergency response phase, but also sustained and long-term support throughout the recovery and reconstruction phases. For staff members who serve as the frontline of assistance and as a vital resource for evacuees, initiatives have included the provision of mental health care, stress management, psychosocial support, and training in communication skills designed to foster both resilience and healing.[6]

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[5] Fukushima Collaborative Recovery Center Archive Editorial Committee (ed.). Ten Years of FUKUSHIMA: Fifty Stories of Civil Society Confronting the Earthquake and Nuclear Disaster. Fukushima Collaborative Recovery Center, 2021. See the case study of the "Future Conference," pp. 237–242.

[6] Fukushima Collaborative Recovery Center Archive Editorial Committee (ed.). Ten Years of FUKUSHIMA: Fifty Stories of Civil Society Confronting the Earthquake and Nuclear Disaster. Fukushima Collaborative Recovery Center, 2021. See the case study of the NPO The People, pp. 182–189.

Ⅳ. Outreach to Surrounding Communities

Minimum Standards

In the context of a nuclear disaster, support shall be provided to surrounding communities so that, alongside host communities, they can engage effectively with evacuee communities and ensure a comprehensive reception framework.

Key Actions

1. In surrounding communities, ensure that the importance of supporting evacuees is fully understood and foster activities that build a comprehensive support framework.
2. Surrounding communities serve as mediators and buffers in the face of tensions or conflicts between evacuee communities and host communities, working to ease frictions and foster improved relations.

Guidance Note：Lessons from Fukushima

In certain regions, evacuees from multiple designated zones found themselves living in close quarters, which at times created tensions. The host community played a mediating role, easing frictions and facilitating inclusive community re-formation. Initially, events were organized separately for each evacuee group, but gradually evolved into region-wide gatherings that fostered dialogue and mutual exchange. This case illustrates how, in the aftermath of a nuclear disaster, structures of cooperation that transcend community boundaries should be established.

In the case of nuclear disaster evacuation, the points of origin often straddle multiple municipalities, each subject to differing conditions of displacement and disparities in compensation and support. Given this, surrounding communities are called upon to serve as buffers in easing frictions among evacuee communities, and to support coordination toward inclusive community building. It is also essential to cultivate a wider understanding of the unique nature of such disasters, for instance by welcoming visitors from outside the region, fostering awareness of the current situation, and building networks of solidarity for recovery.

(Tsutomu Nakayama)

Column: Recovery and Town Planning Should Be Community-Led

What is required to ensure that, once evacuation orders or restricted zones are lifted, people can resume a way of life comparable to that which existed before the nuclear disaster, as envisioned in the Japanese Red Cross guidelines?

Disparities in the designation of evacuation zones, compensation and assistance, assessments of radiation risk, and decisions regarding evacuation—together with divergent views on extraterritorial community formation, provisional town concepts, and second-town development—have inevitably given rise to friction and division within communities. These factors require systematic re-evaluation and clarification of challenges. Equally critical, from the perspectives of resident participation, community autonomy, and localization, is the extent to which the intentions of affected residents were integrated into recovery and town planning processes, and whether support structures capable of ensuring such integration were established. Both dimensions are central to shaping future recovery frameworks.

In Fukushima, a series of resident-participatory, community-driven reconstruction workshops were held, through which proposed comprehensive policies were, in some cases, adopted by municipalities and subsequently reflected in the development of public reconstruction housing complexes[7].

In areas where evacuation and exclusion orders have been lifted, reconstruction is now driven largely by local governments, new residents, and external corporations. Yet many long-time residents express disquiet: “we only want our town rehabilitated as it was before the nuclear disaster, but it keeps changing into a place we no longer know.” In response, initiatives have emerged to preserve cherished landscapes through art and to protect memorable buildings through citizen movements. The pressing challenge is how such community-led, participatory approaches can be integrated into the broader process of reconstruction, for it is these that will underpin the future of recovery.

[7] See glossary section for details

Assistance that leaves no one behind

Individuals with high vulnerabilities, including people with disabilities, the elderly, women, children, and those with foreign backgrounds, face multiple barriers in daily life, which are further compounded during disasters[1]. In the context of a nuclear emergency, these challenges are exacerbated[2], particularly in relation to access to information, mobility and evacuation[3], sustaining daily life, and adapting to the environment. In 2015, the UN World Conference on Disaster Risk Reduction in Sendai adopted the "Sendai Framework for Disaster Risk Reduction 2015–2030[4]", which, grounded in the SDG principle of "leaving no one behind," set a course toward inclusive disaster risk reduction. Significantly, this was the first international framework to explicitly recognize persons with disabilities, the elderly, those requiring medical care, pregnant women, children, and people with foreign roots as stakeholders in disaster resilience.

Building on this, even under nuclear disasters, It is imperative to uphold attention to the diversity and intersectionality of vulnerable groups and to respect their agency and decision-making, so as to strengthen effective protection and evacuation that leaves no one behind. Equally essential is the provision of education, health care, nursing, and psychosocial support to all children, including those with disabilities and those living in or attending child welfare institutions.

Ⅰ. Support for Persons in Need of Special Care

Minimum Standards

Support for the protection and evacuation of vulnerable populations in the context of a nuclear disaster should be implemented in accordance with the "Principles of Protection[5]" outlined in the Sphere Handbook[6], thereby assisting people both in their recovery from disaster impacts while ensuring rights and entitlement.

Key Actions

1. Protection and Evacuation Support for Vulnerable Populations

(1) Relief workers must address and mitigate the full range of risks and vulnerabilities faced by people, including the potential negative impacts of assistance itself.

(2) Relief workers must identify and remove barriers to assistance, ensuring equitable support that meets both the specific demands of nuclear disasters and the unique needs of individuals.

(3) In line with humanitarian principles and relevant laws, relief actors must take countermeasures against any actions that deprive people of their basic needs.

(4) Ensure that people receive the support they need and are protected from any form of discrimination or prejudice.

(5) Ensure that no one is left behind and that all those affected by disaster receive support[7].

2. Support the rehabilitation of vulnerable individuals who have suffered physical or psychological harm due to violence, discrimination, or prejudice associated with the nuclear disaster.

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[1] Masaki Urano, Jun Ōyane, and Tadahiro Yoshikawa, eds. (2007). An Introduction to Reconstruction Community Studies. Kōbundō.

[2] Japanese Red Cross Society (2018). Guidelines for Relief Activities in Nuclear Disasters (November 2018 edition), pp. 5–6.

[3] Iwahori, S. (2013). "Chapter 19: Those Left Behind – The Extremely Difficult Evacuation of Persons with Disabilities." In The Trap of Prometheus 4 (pp. 12–53). Special Investigative Reporting Division, Asahi Shimbun.

[4] Ministry of Foreign Affairs (MOFA) Sendai Framework for Disaster Risk Reduction 2015–2030 (provisional translation). https://www.mofa.go.jp/mofa/files/000081166.pdf Accessed December 9, 2024.

[5] Sphere Handbook: The Humanitarian Charter and Minimum Standards in Humanitarian Response, Japanese Edition, 4th Edition, 2019, pp. 33-47

[6] Sphere Handbook: The Humanitarian Charter and Minimum Standards in Humanitarian Response, Japanese Edition, 4th Edition, 2019

[7] Atsushi Naoe, Sayako Nogiwa, et al (2016) "AAR Japan' s partnership in megadisadster: the Great East Japan Earthquake ": TOGETHER WE STAND: World Humanitarian Summit, pp.75-78.

(1) Provide essential supplies and safe spaces for protection from violence, along with contact information such as hotline numbers, to connect survivors with appropriate support services.
(2) Take appropriate measures to ensure that vulnerable groups affected by nuclear disasters are not subjected to further violence, oppression, or deprivation.
(3) In the face of a nuclear disaster, support efforts to restore dignity and rights, and to empower communities to ensure their own safety.[8]
(4) Relief workers shall aid disaster affected populations in asserting their rights through information and documentation, and in advancing the respect of those rights.
(5) Relief should ensure that individuals and their representative organizations can advocate for their rights and voice their views with backing from government and other relevant bodies.
(6) Access to essential documents and data for all affected populations should be facilitated.
(7) Uphold the rights of vulnerable populations and ensure full respect for relevant laws, contributing to the establishment of a stronger human rights protection environment.[9]

Guidance Note: Lessons from Fukushima

Humanitarian Relief

The way relief is delivered and the environment in which it operates can heighten the vulnerability of at-risk groups to violence, discrimination, and prejudice linked to nuclear disasters. Guided by the Sphere Handbook's principles of rights protection, humanitarian relief should strengthen the safety, dignity, and rights of affected people through prevention, response, redress, and the creation of enabling environments.

Regular Situation Analysis

Work with vulnerable individuals and groups affected by nuclear disasters to conduct regular risk analyses, ensuring an understanding of evolving conditions and anticipating potential impacts of humanitarian relief on people's safety, dignity, and rights.

Community Protection Mechanisms

Relief workers should act on the principle that humanitarian assistance must never diminish people's ability to protect themselves or others. Support should help vulnerable people understand and access the means to safeguard themselves, their families, and both their home and host communities, while encouraging community-driven self-help efforts. In Fukushima Prefecture, evacuations often led to the separation of families—such as mothers and children or persons with disabilities—highlighting the need for measures that prevent such divisions and keep households together.

Sensitive Information

Relief workers must exercise strict caution to ensure that recording or sharing information does not endanger vulnerable people. Clear policies should be established for the collection and use of such information.

Equity

Set priorities solely on the basis of individual needs, and provide support accordingly—for example, ensuring that women with disabilities receive assistance from female caregivers with changing clothes, toilet use, and bathing.

Right to Humanitarian Relief

If local authorities cannot meet the basic needs of vulnerable people, impartial relief by humanitarian aid organizations should not be denied.

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[8] Higashi Nihon Daishinsai Josei Shien Network (2012). Bring Gender Perspectives into Disaster Relief! The Support We Needed! Lessons from the Field on Disaster Relief that Responds to Women and Diverse Needs, pp. 6–7, 17, 20.

[9] Shiraishi, Kiyoharu. (2013). "Overview of JDF Fukushima Disability Support Center Activities One Year after the Disaster and Disaster Risk Reduction Initiatives." In Report on Support for Persons with Disabilities in the Great East Japan Earthquake: Activities and Recommendations by the Japan Disability Forum and Related Organizations, ed. Japan Disability Forum, 25–32.

Ⅱ. Ensuring Ongoing Education, Healthcare, and Nursing Support for All Children

Minimum Standards

All children, including those with disabilities and those in child welfare facilities, must be protected from the adverse impacts of nuclear disasters. Relevant organizations/authorities should work together to provide uninterrupted education and learning opportunities, as well as health, medical, and nursing services.

Key Actions

1. Ensure participation of affected community in education planning.
   (1) Affected communities of nuclear disasters must be guaranteed the freedom to participate, without discrimination or prejudice, in the analysis, planning, implementation, monitoring, and evaluation of educational initiatives.
   (2) Necessary community resources must be secured and made available to provide age-appropriate learning opportunities.
   (3) Plan and implement community-based participatory activities that foster awareness to ensure that all children and young people are guaranteed the right to quality, appropriate education.

2. Establish mechanisms conducive to coordination among relief actors.
   (1) To ensure universal access to and continuity of quality education, mechanisms for coordination among relief organizations and workers should be established, and their activities supported.
   (2) Health care and nursing services are delivered through multi-sectoral coordination and collaboration.

3. Conducting ongoing analysis, monitoring, and evaluation
   (1) In emergencies, a participatory, transparent, and comprehensive educational assessment is conducted swiftly.
   (2) Regular monitoring is carried out on educational initiatives and the evolving educational needs of those affected by nuclear disasters.
   (3) Comprehensive educational measures specify strategies for removing factors and barriers that infringe upon the right to education in both evacuated and host communities.
   (4) Systematic, impartial evaluations help improve responses to educational needs and strengthen accountability to the specific situations and requirements of each individual.
   (5) An environment is established in which all children in areas affected by nuclear disasters can regularly and continuously receive radiation monitoring (surface contamination, whole-body counters, urine cesium testing), thyroid examinations (thyroid exposure levels), and stress reduction/mental health care.

Guidance Note: Lessons from Fukushima

Safe Spaces

Ensure uninterrupted education[10] for all children and access to health, nursing, and caregiving services for all people. Support must be delivered in the safest possible environments, actively seeking ways to minimize threats and vulnerabilities—for example, by providing education and healthcare in locations accessible to everyone in safety.

Discrimination

Provide accurate information and educational opportunities to prevent prejudice or misinformation related to nuclear disasters from leading to discrimination or bullying of evacuees. Note that causes of discrimination may not be intentional; they can also include inaccessible educational infrastructure for persons with physical disabilities, or policies and practices that obstruct access to education for learners requiring special accommodations.

Discrimination refers to barriers arising from factors such as sex, age, physical disability, HIV status, nationality, race, ethnicity, tribe, clan, caste, religion, language, culture, political opinion,

[10] Ochanomizu Women's University, International Cooperation Seminar. Education Minimum Standards (Minimum Standards for Education in Emergencies) 2010 – Preparedness, Response, Recovery. 2010.

sexual orientation, socioeconomic background, geographic location, or special educational needs.

Emergencies

In times of emergency, certain groups or individuals may face particular difficulties in accessing education. Evacuation from areas affected by nuclear disasters can further increase people's vulnerability. These groups include persons with physical, intellectual, or psychosocial disabilities; those with severe mental illness or profound impairments; girls and young people; youth who are the breadwinners; teenage mothers; children in need of protection, including those living in or attending residential childcare facilities; and members of specific ethnic or other social groups.

Broad Access to Education

Broad Access to Education

High-quality educational opportunities should be provided across a wide range. These opportunities must be relevant to learners and their circumstances and include the following:

- ·Early childhood, primary, secondary, and higher education, literacy and numeracy, life skills education, and youth and adult programs such as technical and vocational training.
- ·In the critical context of a nuclear disaster, until formal education can be established or resumed, child-friendly spaces and temporary shelters should be provided to address children's initial educational needs.

Flexibility

Learning opportunities must be flexible and adaptable to the situation. These opportunities include the following:

- ·Modifiable lesson plans, schedules, shifts, and annual plans tailored to specific learner groups.
- ·Alternatives such as self-study, remote learning, accelerated or remedial programs to address delays in the curriculum.
- ·Consideration and services for learners with childcare or caregiving responsibilities.
- ·Waivers for the submission of required documents such as age or birth certificates for school enrollment.

Flexible implementation should be discussed with community stakeholders, including those who are often marginalized or excluded. Relevant educational institutions should be involved to ensure that the proposed measures are effectively applied. When learners are dispersed due to wide-area evacuation, schools and other educational facilities should be strategically located to provide the most economically accessible learning opportunities.

Priority in Education During Emergencies

Decisions on prioritization should be based on initial assessments. It is important to consider the following:

- ·Data disaggregated by sex and age, information related to vulnerability and protection, life-saving information, particularly urgent needs, and coordination with the restoration of the education system.

Educational Resources

The government bears ultimate responsibility for the provision of education. This includes ensuring sufficient funding, resources, and the coordination and allocation of personnel. When the government faces challenges in delivering adequate education from the emergency phase through recovery, support may be sought from other sources. Relief organizations must flexibly employ and coordinate various support methods to guarantee continuity of education and opportunities for autonomous learning.

Temporary Utilization of Educational Facilities as Evacuation Shelters

When educational facilities are temporarily used as evacuation shelters during disasters, negative impacts such as interruptions to education and security risks must be minimized. To prevent the collapse of educational activities, stakeholders should avoid protracted stays of affected populations and agree in advance on the date and condition for returning facilities to their original

function. It is essential to protect school assets, including books, libraries, equipment, academic records, and recreational materials. Stakeholders should also coordinate to reinforce and renovate educational facilities, including public hygiene facilities such as toilets and handwashing areas, and the structural integrity of buildings.

Coordination Among Health, Nursing, and Multi-Disciplinary Professionals

Vulnerable populations include the elderly, persons with disabilities, pregnant and postpartum individuals, and children. Some people may experience overlapping or intersecting vulnerabilities, such as women with disabilities[11]. Providing necessary health and nursing care requires close coordination among multiple professionals, including physicians, nurses, public health nurses, pharmacists, care workers, physical therapists, clinical psychologists, and school social workers. [12]/[13]

Access to Thyroid Examinations

Radioactive iodine is one of the radioactive substances released during nuclear fission. When the thyroid absorbs it, DNA damage can occur in thyroid cells. Children are particularly at risk because their cells divide more rapidly than adults, which can increase the likelihood of developing cancer several years to over a decade later[14]. In addition to measuring radiation exposure (surface contamination, whole-body counters) and conducting thyroid examinations, it is also essential to provide stress reduction and mental health care tailored to each affected individual's situation and needs.[15]

(Sayako Nogiwa)

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[11] Kumiko Fujiwara, "Initiatives for Disaster Prevention Incorporating the Perspectives of Women with Disabilities," in DPI Women with Disabilities Network, Difficulties Faced by Women with Disabilities: Survey on Multiple Discrimination and Activities over the Following 10 Years, 2023, pp. 68–69.

[12] Watanabe, Hideo. (2017). "Collaboration between Nursing Professionals and Multidisciplinary Teams is Essential for Effective Support of Disaster-Affected Populations." Community Care, Special Issue November 2017: Don't Overlook Vulnerable People – What Home-Visit Nurses Can Do in Disaster Response, pp. 89–94.

[13] Ikeda, Keiko. (2017). "Conveying Gendered Differences in Disaster Impact to Stakeholders and Vulnerable Populations." Community Care, Special Issue November 2017: Don't Overlook Vulnerable People – What Home-Visit Nurses Can Do in Disaster Response, pp. 95–100.

[14] NHK Fukushima Web Special "Explanation: Great East Japan Earthquake and Nuclear Accident 'Thyroid Screening'" URL: https://www.nhk.or.jp/fukushima/lreport/article/000/57/, Viewed: 20241208

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Part Ⅲ

Unresolved Issues

Unresolved Challenges

As we conclude the compilation of this guide, we have chosen to leave on record, for the reader's reference, the challenges that could not be fully addressed within its pages. For each item, we outline the perspectives that are desirable to adopt in order to foster an environment where the dignity and rights of disaster-affected people are upheld.

1. Consequences for Livelihood and Family

The Japanese Red Cross guidelines[1] referenced in this guide note that "concerns about radiation's effects on children and the need to secure an income during evacuation have led many families to live separately during displacement," highlighting how this disaster affects both work and family life. A common pattern arises when heads of households, who primarily support the family financially, remain in the affected area to continue working, resulting in mother-child evacuations. Differences in views on radiation risk can also cause family divisions when making evacuation decisions outside designated evacuation zones or specific recommended areas. Often, fathers make decisions based on financial realities while mothers prioritize family health and safety, though there are cases in which fathers place health and safety first.

Compared with natural disasters, nuclear disasters often force affected individuals to make difficult choices between continuing their regular work and maintaining family life. In regions with many agricultural or livestock workers, particularly acute cases can arise. Relief workers are expected to support evacuees so that they can make informed decisions that satisfy both needs.

While humanitarian organizations and relief workers do not directly handle compensation or support payments related to radiation exposure or evacuation, they must ensure that all family members have equal access to information and that employment support reflecting changes in household circumstances is provided in a timely manner.

<Illustrative Perspectives>

- In the context of nuclear disaster evacuation orders or decisions to leave areas outside designated zones, families may be separated due to work. It should be asked whether adequate support and consideration are provided for such situations.
- Are there government or private consultation services and support systems addressing multiple issues, such as family breakdowns or challenges in rebuilding lives, arising from differing views on evacuation and radiation risks, or access to compensation and relief funds?
- Is support for psychological counseling available from the initial stages?
- Are individual consultation services in place for employment, compensation, and both physical and mental health?
- After the disaster, is sufficient access to information ensured for both those who evacuated and those who remained, and can people who evacuated to distant regions across the country easily obtain information from their original municipalities according to their needs?
- Is access to alternative dispute resolution (ADR) and courts regarding evacuation ensured for all disaster-affected people, and is it administered fairly and promptly?

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2. Consideration for Pets

Pets are family members who live alongside individuals, forming meaningful bonds and sharing each other's lives; as such, their lives are valued. In the context of a nuclear disaster, adequate arrangements for accommodating pets were often lacking, forcing evacuees to leave them behind. Such situations cause profound distress for affected individuals, requiring careful attention to their needs.Activities to alleviate the psychological suffering caused by separation from pets are essential. Through protection, rescue, and public communication, grief can be eased, wounds can be healed, and whenever possible, continuity of life for the animals should be maintained through relocation, foster care, or other means. In evacuation centers, support must ensure both respect for pets' lives and the physical and mental safety of both pets and their owners, allowing them to live together as safely as possible during evacuation.

<Illustrative Perspectives>

Are protection and rescue activities carried out with full understanding of the affected individuals' circumstances and feelings? Is the continuity of life for pets ensured as much as possible through allowed care, relocation, or foster arrangements?

3. Considerations on Food Safety

In a nuclear disaster, information on food, including agricultural products, which should be reliable, often became uncertain, and information sharing was insufficient. Ideally, producers should be supported so that food safety standards and measurement methods can be established in ways they can trust, and their right to carry out these measurements is protected; in practice, this support was often lacking.

For producers, the impact was severe, affecting both their livelihoods and means of subsistence. They needed to respond to production and sales suspensions due to radioactive contamination and conduct radiation measurements to fulfill their accountability when resuming sales.

For consumers, radiation monitoring was essential to make informed decisions, avoid internal exposure, and determine whether food was safe for children. The Japanese Red Cross guidelines outline the following key points to consider.

> Radiation is considered particularly risky for children, raising concerns about increased anxiety and stress among families with young children (p.18).
>
> Among the general public, anxiety about a nuclear disaster heightens the demand for accurate information. At the same time, social disruption can prevent essential knowledge from being effectively communicated, potentially hindering appropriate protective actions against radiation exposure (p.5).
>
> The effects of low-dose radiation exposure on the human body are not yet fully understood, and there is a possibility of long-term health impacts (p.4)
>
> (Japanese Red Cross guidelines).

Radiation can affect not only cancer risk but also fetal development and the immune system; therefore, there is no truly safe level of exposure, and radiation should be avoided whenever possible. While it is important for producers to resume production and sales, the serious concerns and anxieties of consumers regarding health must be addressed either prior to or alongside the resumption of production.

<Illustrative Perspectives>

- Is the safety information indicated on food based on scientific evidence?
- Are consumers' rights to know about radiation and to take protective actions upheld?
- Are support systems in place to help primary producers—agriculture, fisheries, forestry, and livestock—fulfill their responsibilities and ensure consumers can make informed, confident purchases? Additionally, are ongoing test operations and radiation monitoring activities

conducted to safeguard food safety?

- Are consumers able to independently distinguish between safe and unsafe food based on multiple radiation measurement results and feel confident in the safety of what they eat? Do they have opportunities to voice concerns or questions freely and seek a second opinion when needed? (Regarding safety, there may be multiple differing scientific opinions.)

<Reference Materials>

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4. Destruction and Protection of Local Culture

Cultural transmission is central to future-focused reconstruction. In Fukushima, prolonged evacuations have displaced residents from communities rooted in nature and tradition. To preserve traditional crafts (woodworking, local ceramics, etc.) and historic buildings, practitioners face the difficult choice of returning or staying behind. Local arts and festivals play a crucial role, both in heritage preservation and in supporting community well-being.

<Illustrative Perspectives>

- Are evacuees being supported in preserving cultural heritage and high-value crafts derived from local traditions, with full consideration for personal identity and emotional impact, while ensuring their physical safety?
- Are efforts being made to protect or restore regional culture, historic buildings, traditional crafts, and performing arts from disaster-related damage?
- From the perspective of emotional well-being, community healing, and social reconstruction, is support being provided for the revival and preservation of culture and artistic activities in disaster-affected areas and in regions where evacuation orders or restrictions have been lifted?

< Reference Materials>

◎ Ibid., FUKUSHIMA’s 10 Years:

(Tsutomu Yamanaka)

Conclusion

As noted at the outset, the Great East Japan Earthquake on March 11, 2011, and the rapidly escalating nuclear disaster at the three reactors of Tokyo Electric Power Company's Fukushima Daiichi Nuclear Power Plant, produced a vast number of evacuees and affected residents in a matter of days. In Fukushima Prefecture, the number of evacuees reached approximately 165,000 by May of that year, and even more than thirteen years later, in June 2024, 25,798 people remain displaced. The decommissioning of the three reactors is still far from complete. The Fukushima nuclear disaster is not over.

Immediately after the disaster, the international cooperation NGO where the author was serving as a board member, like many other NPOs and NGOs, initially transported relief supplies to Ibaraki Prefecture, just south of Fukushima, while others were heading to Miyagi and Iwate. On March 20, they entered southern Fukushima. At that time, the author was asked by phone for approval to enter Fukushima. Lacking basic knowledge of radiation and with almost no understanding of the nuclear disaster unfolding, the author gave the go-ahead, overwhelmed by the staff's enthusiasm and feeling anxious. It can be assumed that many Japanese NPOs and NGOs faced similar circumstances at the time.

Later, during two visits to Fukushima, the author vividly recalls being tearfully reproached by acquaintances living in the prefecture, who said that even NGOs that typically dive into the most difficult situations had abandoned Fukushima.

A nuclear disaster should never happen again, yet the reality of the world offers little room for optimism. Currently, there are 595 nuclear reactors worldwide, and their number is increasing, particularly in emerging countries and the Global South. For example, in Bangladesh, Russia is in the process of constructing two reactors, with completion imminent[1]. In addition, in November 2024, the 29th Conference of the Parties (COP29) to the United Nations Framework Convention on Climate Change (UNFCCC) was held in Baku, Azerbaijan, and Japanese newspapers reported that the conference atmosphere strongly suggested that nuclear power was unavoidable in order to reduce greenhouse gas emissions[2].

In Ukraine, where Russia continues its military actions, Russia has repeatedly attacked the Zaporizhzhia nuclear plant, has spoken of the possibility of using nuclear weapons, and North Korea continues launching missiles capable of carrying nuclear warheads. In other words, the risk of a large-scale nuclear disaster is higher than ever.

This guide was created out of our strong desire to minimize, as much as possible, the radiation exposure of relief organizations and workers should such an unfortunate event occur.

Another distinctive aspect of nuclear disasters is the deep involvement of governments and large corporations, due to high technology and the handling of radioactive materials, which are subject to strict regulations. In Japan, the long-standing "nuclear safety myth[3]" promoted by both the government and nuclear operators left preparations for responding to accidents and disasters insufficient. Similarly, the outflow of detailed information on the unfolding situation and radiation measurements was not always accurate, timely, or comprehensive. In the case of Fukushima, there were also suspicions that the government sought to downplay the scale of the nuclear disaster.

Yet, the NPOs and NGOs that stepped in did more than merely assist evacuees in shelters alongside local governments and the Self-Defense Forces—they also empowered citizens and affected residents to measure radiation levels and broadcast the results. In Fukushima and neighboring areas, a proliferation of "citizen radiation monitoring stations" arose, often providing far more granular data than the government and, in many cases, revealing harsher exposure realities. This experience vividly illustrates why, in the event of future nuclear disasters, citizens must engage with both careful prudence and bold, proactive initiative.

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[1] As of January 2024, there are 595 nuclear power reactors in 38 countries worldwide, including Japan. Current Status of Global Nuclear Power Development as of January 1, 2024, Japan Atomic Industrial Forum, Inc. (JAIF) website, https://www.jaif.or.jp/pressrelease/worldnpp2024 (accessed November 29, 2024).

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Ministry of Economy, Trade and Industry Website (Electric Power Industry Federation)

This guide centers on the essential information and conditions needed to provide support to victims of nuclear disasters, as well as points to keep in mind when support is offered by aid organizations and local communities. There is still room to further develop guidance on the specific roles that civil society organizations, such as NGOs and NPOs, should play in this disaster.

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We would also like to note that the idea for creating this guide originated with Takeshi Komino, former co-chair of JPF and member of the steering committee. At its core lies Ten Lessons from Fukushima[4], a resource created ten years ago by Mr.Komino, the author, and collaborators including Emiko Fujioka, which has since been made available in more than a dozen languages.

In the hope that nuclear disasters remain confined to the history books!

(Chair of the Steering Committee: Masaaki Ohashi)

[4] Fukushima Booklet Committee
"Fukushima: Ten Lessons to Protect People from Nuclear Disasters" 2015
http://fukushimalessons.jp/assets/content/doc/Fukushima10Lessons_JPN.pdf

Guidelines for the Initiation of Humanitarian Assistance under Nuclear Disaster Conditions

To guide organizations and supporters in delivering assistance rooted in the rights and needs of disaster survivors

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