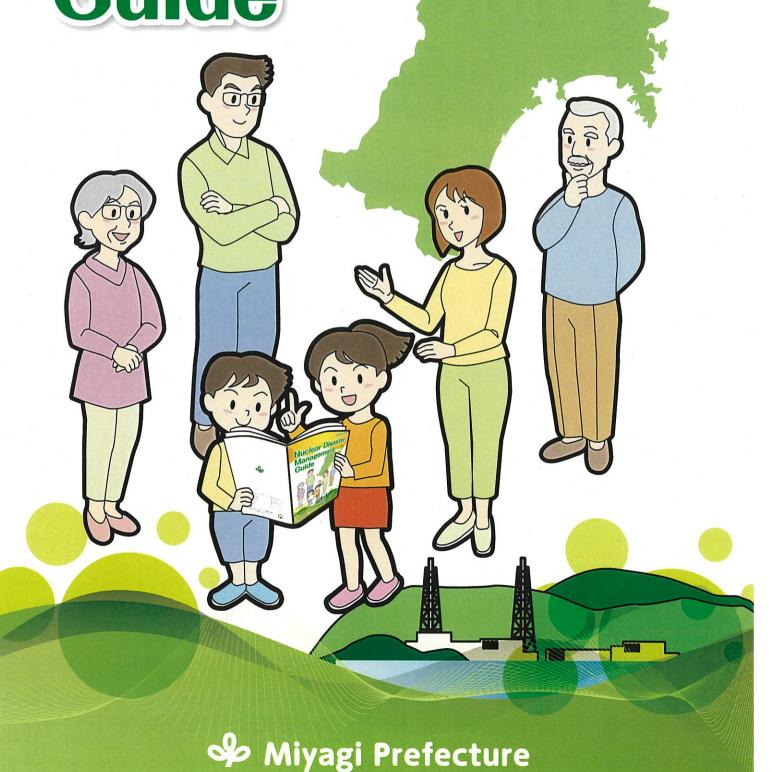
Published:December 2019

Nuclear Disaster Management Guide



Introduction

- This pamphlet was created as a guide for residents in the event of an accident at a nuclear facility such as the Tohoku Electric Power Company-operated Onagawa Nuclear Power Plant, or when otherwise confronted with a nuclear disaster.
- · Please acquaint yourself with the information, and keep this guide in a convenient place.

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What is a nuclear disaster?

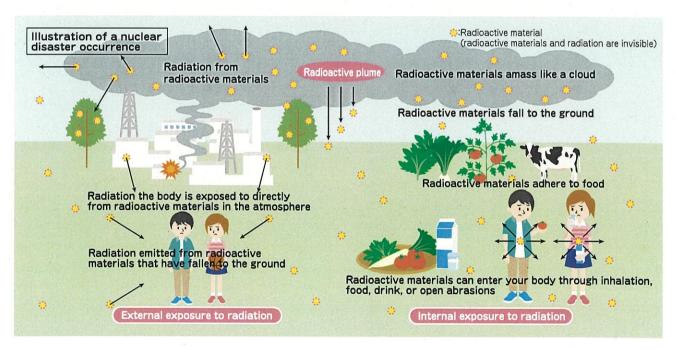
"Nuclear disaster" refers to damage caused by radioactive material or radiation that has leaked from a nuclear facility due to an accident. Compared to natural disasters, a nuclear disaster has mainly the following characteristics.

What are the characteristics of a nuclear disaster?

- Unlike storms, floods, earthquakes, fires and other disasters, the damages caused by radioactive materials from a nuclear disaster are invisible and have no scent. They are imperceptible by the five senses.
- However, in preparation for any disaster, we are now regularly measuring radiation and will inform residents of the situation concerning damage from an accident at a nuclear facility.

What happens when there is an accident at a nuclear power plant?

- An accident at the nuclear facility could lead to radioactive materials leaking into the surrounding area, risking radiation exposure.
- Radioactive materials amass like a cloud (radioactive plume), and spread downwind.
- Radiation exposure can occur by direct contact of radioactive materials with the body (external exposure) or by inhaling or ingesting radioactive materials (internal exposure).
- To reduce internal exposure, restrictions may be placed on the consumption of food and beverages produced in the affected area.





In order to protect yourself from nuclear disasters, the appropriate knowledge concerning nuclear disaster safety is required. Regularly keep an eye out for information given by the national, prefectural and municipal governments and confirm your actions in the event of a disaster.



What is radiation/radioactivity/ radioactive material?

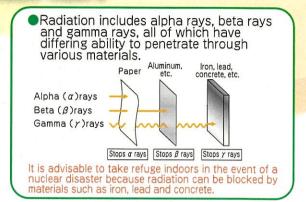
The particles and electromagnetic waves emitted by radioactive material are called "radiation", the ability to emit radiation is known as "radioactivity" and material that is radioactive is known as 'radioactive material".

Torch comparison

The torch is the radioactive material

The ability to give off light is radioactivity

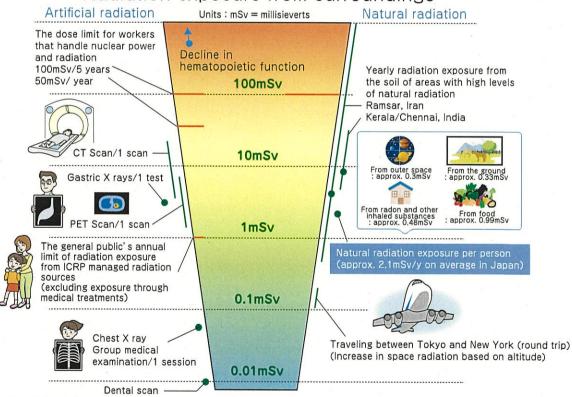
The light is the radiation



Radiation in Daily-life

- Radioactive materials have been in existence since before human beings. We are exposed to radiation all around us every day in the ground, the air, and in our food. Radiation is also used for medical treatment.
- Radiation damages our cells, but the body can repair the damage.
- A Japanese person receives on average 2.1 millisieverts per year (mSv/y)from natural radiation exposure.

Radiation exposure from surroundings



Units of radiation dosage

Absorbed radiation amount by various organs/tissues: Gy(gray) Physical amount of energy received from radiation per unit of weight in organs and tissues.

Effective dose:mSv(millisieverts)

Accumulated radiation amount absorbed by tissues and organs weighted against the susceptibility to cancer or genetic abnormalities. Used when talking about radiation protection.

Gamma radiation measured at 1Gy absorbed evenly by the body is equivalent to 1000mSv.

- · UNSCEAR 2008 Report
- · ICRP 2007 Recommendation
- · The Japan Association of Radiological Technologists' guidelines for medical exposure
- · Based on the new edition of "Radiation in Living Environments" and other publications by the National Institute of Radiological Sciences. (May, 2013)

3

What should I be aware of in the event of a nuclear disaster?

- •You will be notified of information about the nuclear disaster through all means available including television, radio, emergency broadcast systems, cable broadcast and emergency announcement vehicles.
 - •There are instances where incorrect information may spread; it is important to wait for the correct information and instructions provided by official organizations and calmly act accordingly.

When listening to information about a nuclear disaster, what do you do?



Turn on the television or radio for precise information.



Pay attention to information broadcasts on emergency broadcast systems, emergency announcement vehicles and the internet



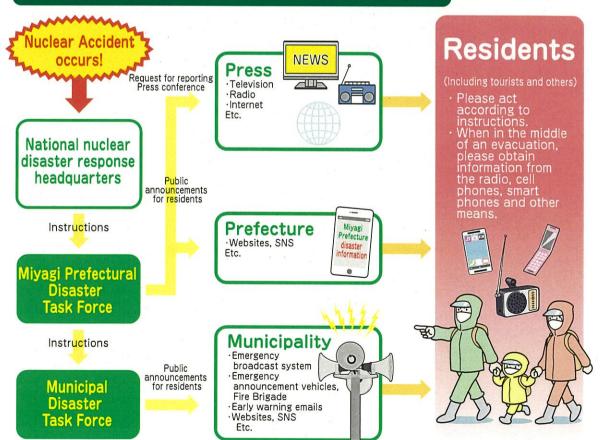
Fishing vessels and boats in the middle of navigating will receive information from organizations such as the Japan Coast Guard and fishery broadcasting office.



Confirm information with your neighbors.

Act according to government information and be careful not to be misled by false rumors.

How is information about the disaster conveyed?





Areas within an approximate 5 km radius (PAZ) of the nuclear power plant and an approximate 5 km-30 km radius of a nuclear power plant (Semi-PAZ/UPZ).

What is "PAZ/Semi-PAZ/UPZ" ?

 Areas that must concentrate on taking nuclear disaster countermeasures that were established based on events of the Tokyo Electric Power Company's Fukushima Nuclear Power Plant Accident.

PAZ Precautionary Action Zone

- · Areas that must evacuate as a precaution in accordance with the state of the nuclear power plant.
- This applies to areas within an approximate 5 km radius of nuclear power plants.

PAZ Target Areas

I	Onagawa Town	Koyadori, Tsukahama, Iigohama, Nonohama, Oishihara, Yokoura, Takashiro, Kirigasaki, Takenoura, Terama, Izushima			
I	Ishinomaki City Yagawa, Oyagawa, Samenoura, Tomari, Maeami, Yoriiso, Oginohama, Kozumihama				

Semi-PAZ Semi-Precautionary Action Zone

·Like "PAZ", these areas evacuate as a preventative measure depending on the nuclear power plant situation.

•This applies to areas within an approximate 5km-30 km of the nuclear power plant, including remote islands and the Oshika Peninsula area (excluding PAZ).

Semi-PAZ Target Areas

Onagawa Town	Enoshima
Ishinomaki City	Ayukawa, Kinkasan, Niiyama, Futawatashi, Aji, Kugunari, Kobuchi, Kyubun, Ohara, Koamikura, Makinohama, Takenohama, Kitsunezakihama, Sudachihama, Fukkiura, Tahirohama, (Nitoda/Odomari)

UPZ Urgent Protective action planning Zone

- Areas where residents **must take refuge indoors in accordance** with the state of the nuclear power plant, and evacuate or **temporarily relocate in accordance with the results** of air radiation measurements.
- This applies to areas within an approximate 5 km-30 km of the power plant (excluding PAZ) / Semi-PAZ areas).

UPZ Target Areas

Onagawa Town	Areas excluding PAZ and Semi-PAZ			
Ishinomaki City	Areas excluding PAZ and Semi-PAZ			
Tome City	All areas in Tsuyama-cho, all areas in Toyosato-cho			
Higashimatsushima City Kamimachi 1-3, Shimomachi 1-3, Odame, Higashiodame, Sekinouchi 1-3, Sakutaura, Shimoura, A Minamiurashukusha, Yachi, Kamikawado 2-4, Wakaba, Shimokomatsu, Kitakukansha, Ekimae, K Shitanbashiri, Nishishinmachi, Kamikawado 1, Tatenuma, Kazuma 1-2, Dochi, Nitanbashiri, Kamik Maesato, Komatsuminami, Temaneki, Maeyanagi, Gomikura, Jono, Yokonumahigashi, Yokonuma 1-2, Kaigaratsuka 1-2, Kaida, Doba, Takada, Kamihama 1-3, Shimohama 1-2, Nakahigashi, Tera Ura, Yokozeki, Minami 1-6, Shinkawamae, Minamimidori, Minamishin 1-2, Yanagikita, Yanagikam Yanaginishi, Terui, Oshita, Komatsudai, Shioiri, Omote, Naka, Oshima, Ura 1-2, Onokami, Onoshir Takamatsu, Okankami, Okanshimo, Hamaichikami, Hamaichishimo, Hiraoka, Nakashimo, Shinma Kameokahigashi, Kameokaminami, Nobirugaoka 1, Ohama, Murohama, Tsukihama, Satokita, Sat				
Wakuya Town	Oyachi, Tandai			
Misato Town	Koshima			
Minamisanriku Town	Aramachikami, Aramachishimo, Oridatekami, Mitobe, hadenyakami, Hadenyashimo, Tsunomiya, Takihama, Fujihama, Nagashizu, Terahama, Okita, Saido, Utsuno, Hayashi, Okubo			

PAZ

Precautionary Action Zone

Those residing within 5km of the power plant

Prior to the leak of radioactive materials when a serious accident has occurred

▶ ▶ Precautionary evacuation

Those for whom evacuating poses a high health risk

>>> Take refuge in evacuation shelters

Semi-PAZ

Semi-Precautionary Action Zone

Remote islands and Oshika Peninsula areas within 30km of the power plant excluding PAZ areas

Prior to the leak of radioactive materials when a serious accident has occurred

▶ ▶ Precautionary evacuation

Those for whom evacuating poses a high health risk

Take refuge in evacuation shelters

UPZ

Urgent Protective action planning Zone

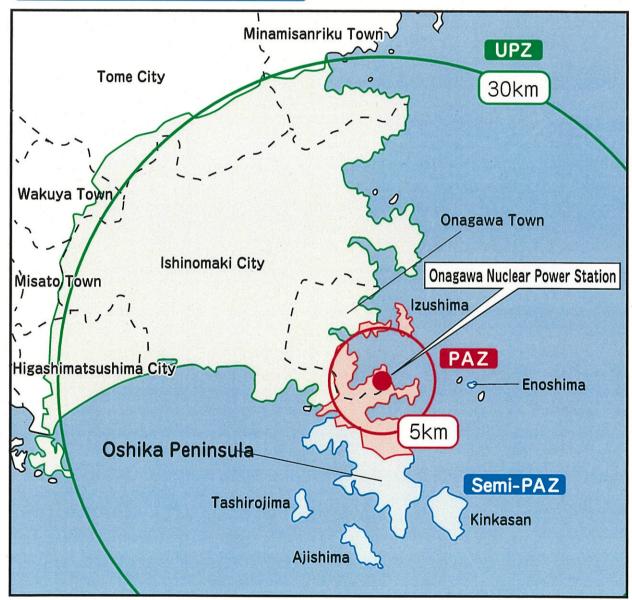
Those residing within 5km-30km of the power plant

As a general rule

▶▶▶ Take refuge indoors

Areas where the spatial radiation level rises above the national limit are to follow instructions

►►► Evacuation/ Temporary relocation



Sources: The Geospatial Information Authority of Japan website (http://maps.gsi.go.jp/#8/35.496456/135.763550)

"Blank Map" created based on reference from Geospatial Information Authority of Japan (http://maps.gsi.go.jp/#8/35.496456/135.763550).



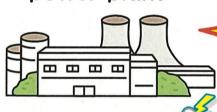
What should I do in the event of a nuclear accident?

In accordance with the instructions of your municipal government, evacuate or take refuge indoors.

What actions should I take? From the occurrence of an accident to evacuation

- If the national, prefectural, and/or municipal government(s) determine(s) that evacuating or taking refuge indoors is necessary, announcements will be made to residents.
- The occurrence of an accident at a nuclear power plant does not necessarily mean radioactive materials will be leaked; there may be situations in which evacuating or taking refuge indoors is not necessary. It is important to stay calm and act according to the instructions and correct information issued by government agencies.

State of the nuclear power plant



Accident occurs!

Likelihood of radioactive materials leaking increases

Situation progresses

Information from national, prefectural and/or municipal government(s)

Instructions on how to respond

Start announcing information for residents

 Notification of the situation at the nuclear power plant and other relevant information (Prior to the leak of radioactive materials) Instructions for evacuation or taking refuge indoors

In response to the situation, PAZ and Semi-PAZ will instruct residents to evacuate while UPZ will instruct residents to take refuge indoors.

Residents' actions

PAZ (~Within 5km)

Semi-PAZ

Obtain accurate information

Evacuation* preparation

Evacuation

**Depending on the situation, certain citizens who need to evacuate at an earlier stage will be instructed to do so.

Taking stable iodine pills(page 13)

UPZ (~Within 5~30km)

Obtain accurate information

Preparation for taking refuge indoors

Take refuge indoors

Leak of radioactive materials

Spatial radiation levels of an area rise above standard

Instructions to continue taking refuge indoors
Strengthen radiation measurement systems

Depending on the situation, in areas where evacuation is deemed necessary, evacuation and temporary relocation instructions will be issued.

- Depending on radiation measurements, in areas where evacuation is deemed necessary, evacuation and temporary relocation instructions will be issued.
- •If necessary residents will be instructed to take stable iodine pills and limit their intake of food and drink.

Continue taking refuge indoors

Evacuation and temporary relocation in specific areas depending on the situation

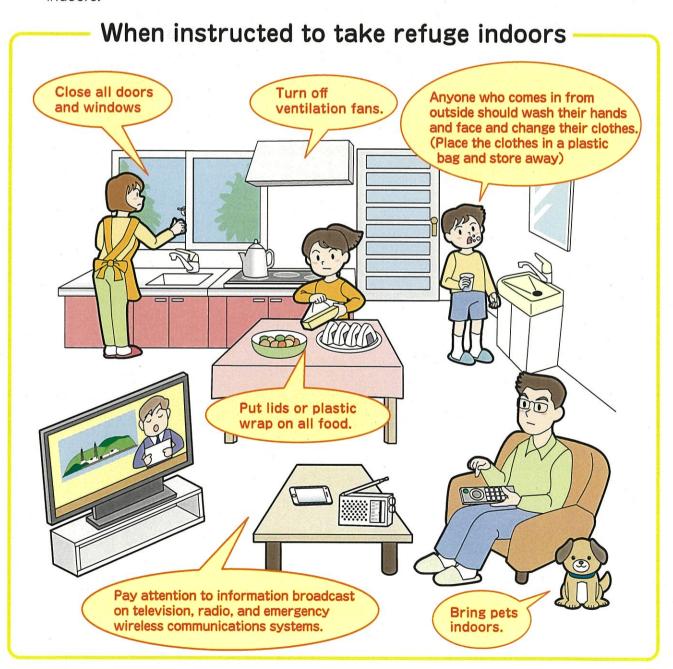
Taking stable iodine pills, restricting food and drink intake



Go inside your residence or a public facility building

How can take refuge effectively?

- By closing doors and windows, you can prevent radioactive materials from entering and minimize exposure to radiation.
- When a radioactive plume(radioactive materials amassed into a cloud) is passing over the area, you can minimize radiation exposure better by taking refuge indoors rather than by going outside to evacuate.
- By taking refuge in a mostly airtight building made of concrete, you can lower the rate of radiation exposure through inhalation to 1/20 of the rate of being outdoors.
- *Air conditioning that does not use air from the outside can be used even while taking refuge indoors.





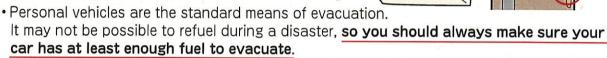
What should I do when instructed to evacuate or temporarily relocate?

Proceed to an evacuation shelter by way of an evacuation screening checkpoint or evacuation shelter reception.

What should I do before evacuating?

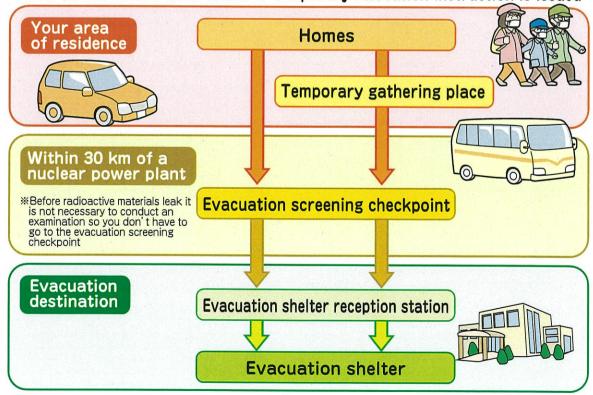
- If evacuation or temporary relocation instructions are issued, confirm the instructions and act on them calmly.
- Make sure to turn off electric breakers and close gas stoppers.
- Don't forget to close and lock your windows and doors.

How should I evacuate?



- When you cannot evacuate by car, proceed to the nearest temporary gathering place and evacuate by bus, ship, helicopter, etc. (manicipal governments designate temporary gathering places for all areas).
- After the leak of radioactive materials, all residents in **UPZ** who are evacuating should evacuate by way of an evacuation screening checkpoint in order to measure the amount of radioactive materials that are adhering to them. At the evacuation screening checkpoint, you will be issued a pass. Please do not lose this as you will be using it at the evacuation shelter reception and other places.
- When you arrive in the city, town, or village to which you evacuate, proceed to the evacuation reception station for directions to your evacuation shelter, then make your way there.

When an evacuation instruction or temporary relocation instruction is issued



Map of proposed sites of evacuation screening checkpoints

- In the event of a radioactive material leak, the necessary inspection stations will be set up.
- Which people from which areas go to which inspection stations is determined by the various municipalities. but this may change in response to a disaster.
- In the event of a nuclear disaster, please follow the

Tome City Nakada Sogotaiikukan (Nakada Gymnasium) instructions of your municipality and evacuate. Hasamagawa Bosai Station 谷米〇 (Hasamagawa Disaster Prevention Station) Wakuya Chiku Kasen Bosai Station (Wakuya area River Disaster Prevention Station) Misato Town Training Center lshinomaki City Kanan Taiiku Center (Kanan Athletics Center) **美里**0 Wakuya Stadium Misato Town Nango Taiikukan (Nango Gymnasium) Ishinomaki City Yugakukan Higashimatsushima City Oshio Shimin Center (Oshio Civic Center) D:O Osato Town Bunkakaikan/Jiyuhiroba ○大郷 B Higashimatsushima City Gakko Kyushoku Center (School lunch Center) 城 巻 石 湾 Kasuga Parking Area (Sanriku Expressway) の七ヶ浜 Higashimatsushima City Takaginomori Undo Koen (Takaginomori Athletics Park) 七北田川 E6 Higashimatsushima City Nobiru Shimin Center (Nobiru Civic Center)

Map data source: Geospatial Information Authority of Japan website(URL: https://maps.gsi.go.jp)



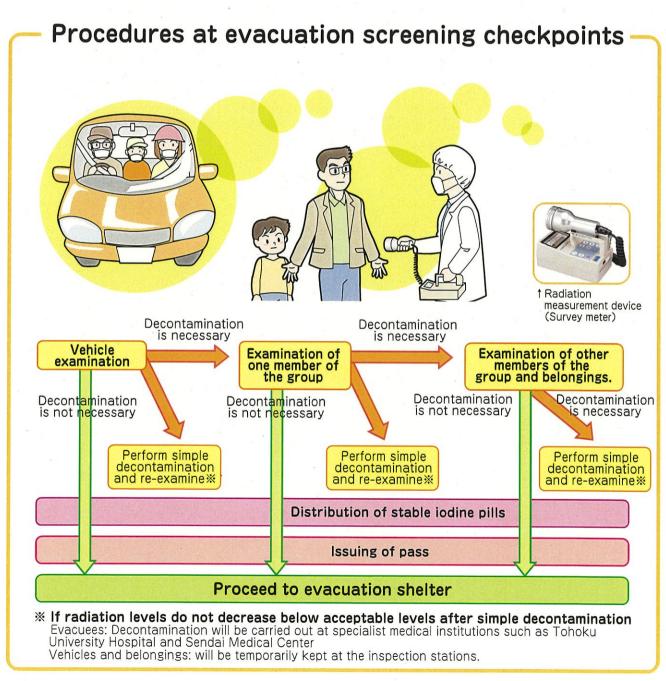


What happens at an "evacuation screening checkpoint"?

> Vehicles and clothing will be checked for radioactive materials.

How are checks carried out?

- Evacuation screening checkpoints will be set up on evacuation routes that lead to evacuation shelters.
- Examinations will be carried out at evacuation screening checkpoints to check for radioactive materials on vehicles, clothing and other belongings.
- If the examination results show more radiation than acceptable levels, decontamination will be carried out.
- After examination, you will be issued a pass which you must take.





What are stable iodine pills?

Medication that prevents/minimizes the thyroid's exposure to radiation from radioiodine.

Taking the medicine may be necessary when evacuating or taking temporary refuge.



Why take a stable iodine pill?

• During a nuclear accident, radioiodine may be released into the atmosphere.

• When radioiodine is absorbed through ingestion or inhalation, it accumulates in the thyroid and causes internal exposure. This can lead to an increased risk of thyroid cancer and other ailments.

• Taking a dosage of non-radioactive iodine can prevent radiation exposure to the thyroid.

• The effects of stable iodine pills last for a limited amount of time so take in cases of evacuation and temporary evacuation in accordance with instructions. Taking the pills at the appropriate time is important.



 Stable iodine pills do not have any effect on radioactive materials other than radioiodine.

•After taking pills, please continue with protective measures such as evacuation and temporary relocation.

About stable iodine pills use

• The national, prefectural, and/or municipal government(s) will issue instructions on stable iodine pills use.

Follow dosage guidelines.

(Taking a larger dose does not increase effectiveness)

Do not take multiple dosages unless given special instruction to do so

1 tim	Approx. Age	Dosage		
	13 years and older	Pill form	2 pills	
ne d	3-12 years old		1 pill	70 1
dosa	1month-2 years old	Jelly form	32.5mg	1packet
age	Newborn infant		16.3mg	1 packet



Pill form (New packaging)



Pill form (Previous packaging)



Jelly form

Points of caution

- Those with past history of allergies to iodine or the ingredients in stable iodine pills cannot take the medication.
- Please consult a doctor or pharmacist if taking these pills while pregnant or if administering the medication to a newborn infant.
- Those taking the medication may experience side effects such as rashes, nausea, vomiting, stomach ache and diarrhea. If side effects are severe, please consult a doctor.

Distribution of stable iodine pills

OFor those living in PAZ / Semi-PAZ

- The prefecture and municipal governments will be holding explanatory meetings beforehand in which they will distribute the stable iodine pills so please be sure to participate.
- The distribution beforehand is aimed at those under 40 years of age, those who are pregnant, women who are nursing children and women who are hoping to have children, but pills will be distributed to those above 40 years of age as well if desired.
- For those who have lost the stable iodine pills distributed beforehand and those who did not receive stable iodine pills beforehand, the local government will distribute them at the temporary gathering locations in accordance with evacuation procedures.

OFor those living in UPZ

 If pills need to be taken, they will be distributed at temporary gathering locations and evacuation screening checkpoints in accordance with evacuation and temporary relocation procedures.

-13-



Where can I find information?

More information can be found on municipality websites and other official sources.

How do I obtain the information?

- In the event of a nuclear disaster, residents will be informed of the situation and how to respond through media such as emergency broadcast systems, notification emails, television and radio.
- To obtain further information, please complete registration and confirmation at your municipality website listed below during a normal period before a disaster.

How to access information from various municipalities

Miyagi Prefecture

Nuclear related

HP Website

Nuclear Energy Safety Policy Division top page http://www.pref.miyagi.jp/soshiki/gentai/



Website

Miyagi radioactivity information website

https://www.r-info-miyagi.jp/r-info/



Disaster prevention related

Website

Emergency/
disaster information

http://www.pref.miyagi.jp/site/emer/



/ Blog

Disaster prevention/ crisis management blog

https://plaza.rakuten.co.jp/bousaimiyagi/

Onagawa Town

HP Website

Disaster prevention related

http://www.town.onagawa.miyagi.jp/

05 03.html



Twitter

Onagawa Town official Twitter account

@TownOnagawa

Ishinomaki City

HP Website

Top page

https://www.city.ishinomaki.lg.jp/index.html



Disaster information email

https://www.city.ishinomaki.lg.jp/cont/10106000/6851/6851.html

%Distribution source :
 is-news@my.e-msg.jp

Facebook

Miyagi Prefecture Ishinomaki City Hall [disaster/disaster prevention/ disaster reduction information] Source

@IshiSaigai

Twitter

Miyagi Prefecture Ishinomaki City Hall [disaster/disaster prevention/ disaster reduction information] Source

@IshiSaigai

Tome City

Website

Top page

https://www.city.tome.miyagi.jp



Email notification service Disaster information email

https://mail.cous.jp/tomecity/ **Distribution source:

Info-mail@city.tome.miyagi.jp

Facebook

Tome City official Facebook account

@city.tome

Higashimatsushima City

HP Website

Top page

http://www.city.higashimatsushima.

miyagi.jp



Email notification service Disaster information email

http://www.city.higashimatsushima. miyagi.jp/sp/index.cfm/17,13513,42,html %Email address for registration:

entry@hm-mail.jp Distribution source: info@hm-mail.jp

Wakuya Town HP Website Top page http://www.town.wakuya.miyagi.jp/ Misato Town HP Website Top page http://www.town.misato.miyagi.jp Minamisanriku Town **HP** Website Nuclear disaster https://www.town.minamisanriku. countermeasures miyagi.jp/index.cfm/30,0,106,html **HP** Website Disaster prevention https://www.town.minamisanriku. miyagi.jp/index.cfm/30,html

	Disaster information email	http://www.town.minamisanriku. miyagi.jp/index.cfm/30,3281,100,1,html %Origin (domain): @minamisanriku.todou.jp
f Facebook	Minamisanriku Town official Twitter account	@town.minamisanriku

Preparation is the same as for a natural disaster, so make a habit of being ready.

Checklist of items to take with you



Have enough fuel in your car.

In the event that a vehicle is necessary for evacuation or temporary relocation, you may not know when you can refuel again. By always keeping some fuel in your tank, you can be sure to have enough to evacuate in an emergency.



The latest the second s	If there are me	ore items write th	nem down!
\checkmark			
	My evac	cuation destination	on
Temporary	gathering place:		
Evacuation	destination:		
	Famil	y contact details	
a m e	Date of birth	Name	Date of birth
orkplace chool, etc)	Phone number	Workplace (school, etc)	Phone number
a m e	Date of birth	Name	Date of birth
orkplace	Phone number	Workplace	Phone number





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