

**Special  
Issue**

# **Nuclear Emergency Preparedness Guide**

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**Echizen City**

English

# Introduction

Various safety measures are taken at nuclear power plants in preparation for natural disasters and major accidents. However, should these measures fail to work and radioactive substances are released into the surrounding environment, our lives will be affected.

What should we do if a serious accident occurs at a nuclear power plant?

Echizen City has compiled this booklet to advise when and how to evacuate, where to go, and other valuable information that could help you in the event of a nuclear disaster.

This booklet will help you with preparations in the event of a nuclear disaster and will help improve your knowledge of actions such as shelter-in-place and evacuating.

## Table of contents

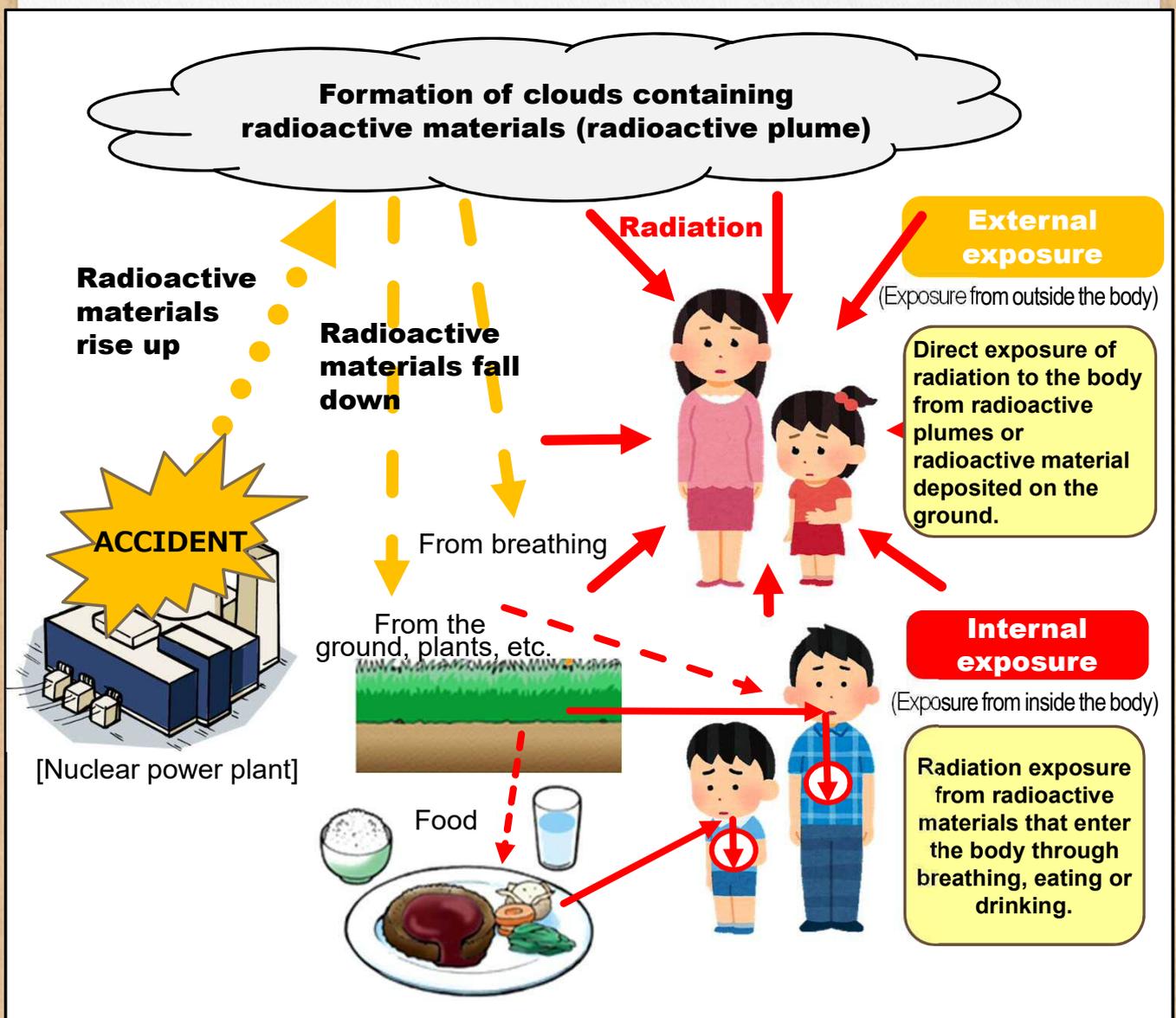
Introduction .....	1
What is a Nuclear Disaster? .....	2
Radioactive Materials and Radiation .....	3
Daily Life and Radiation .....	4
Echizen City and the Nuclear Power Plants.....	5
Course of Action in the Event of a Nuclear Disaster .....	6
Shelter-in-Place .....	7 - 9
Large-Scale Evacuation .....	10 - 11
Temporary Assembly Points .....	12
Stable Iodine agents .....	13
Screening (inspection during evacuation) .....	14 - 15
Where is the Evacuation Site? .....	16
Information Sources .....	17 - 18

# What is a Nuclear Disaster?

A nuclear disaster is the outdoor release of radioactive materials from a nuclear power plant due to a natural disaster or a serious accident, causing damage to the surrounding environment and affecting the residents.

Unlike natural disasters such as earthquakes, storms and floods, radioactive materials and radiation resulting from the fallout of nuclear disasters cannot be felt by the senses.

It is important to know the characteristics of a nuclear disaster and countermeasures in advance in order to be prepared to take appropriate action in the event of an emergency in order to minimize damage.



# Radioactive Material and Radiation

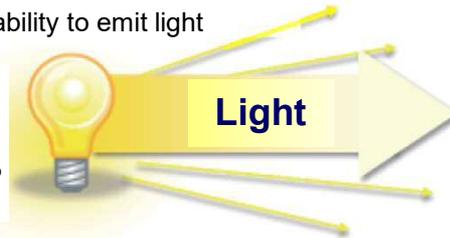
Radioactive material refers to any material that emits radiation, while the ability to emit radiation is called radioactivity.

## If you compare radiation to light ...

- Light bulb = has the ability to emit light

**Lumen (lm)  
Or Watt (W)**

► Unit of brightness of the light bulb



**Lux (lx)**

► Brightness unit

- **Radioactive material** = Has the ability to emit radiation (**radioactivity**)

**Becquerel (Bq)**

► Unit of radioactivity



**Radiation**

Conversion factor

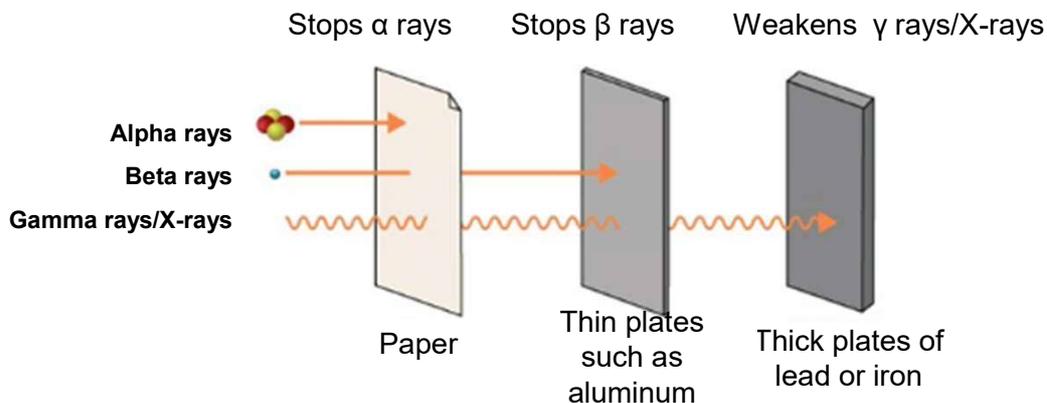
**Sievert**

► Unit of radiation exposure dose received by a person

Source: "BOOKLET to Provide Basic Information Regarding Health Effects of Radiation (2019 edition)" Ministry of the Environment

There are several types of radiation. Among these are  $\alpha$  (alpha) rays,  $\beta$  (beta) rays, and  $\gamma$  (gamma) rays. Radiation has the ability to pass through objects (penetrating power). This penetrating power differs depending on the type of radiation.

## Penetrating Power of Radiation



Source: "BOOKLET to Provide Basic Information Regarding Health Effects of Radiation (2019 edition)" Ministry of the Environment

# Daily Life and Radiation

Are radiation and radioactive materials present only in nuclear disasters?

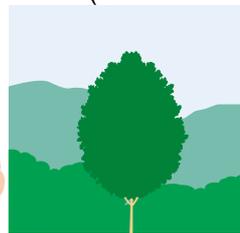
We are exposed to radiation even in our daily lives. Radiation comes from space, within the earth, the air we breathe and even in the food and drinks we consume.

The world average of natural background radiation exposure for a person is 2.4 millisieverts per year.

(Unit: millisievert)



0.39 from space



0.48 from the earth



0.29 from food



From radon in the air 1.26

(Reference) Areas in the World with High Natural Background Radiation (millisieverts/year)

Region / city	Airborne radiation dosage
Madras, Kerala (India)	9.2
Ramsar (Iran)	4.7
Orvieto (Italy)	3.4

Source: Quoted from the Ministry of the Environment's "BOOKLET to Provide Basic Information Regarding Health Effects of Radiation (2019 edition)"



**Pointer!**

The natural background radiation level in Echizen City is about **0.07 to 0.11  $\mu$ Sv per hour.**

# Echizen City and the Nuclear Power Plant

The government of Japan has designated areas within 30km radius of a nuclear power plant as **Priority Areas for Nuclear Disaster Prevention Measures**. The potential for damage from a nuclear disaster is high and thus countermeasures for such an event are prioritized.

## Priority Areas for Nuclear Disaster Prevention Measures

**PAZ (Precautionary Action Zone)**  
(Area to prepare precautionary protective measures)

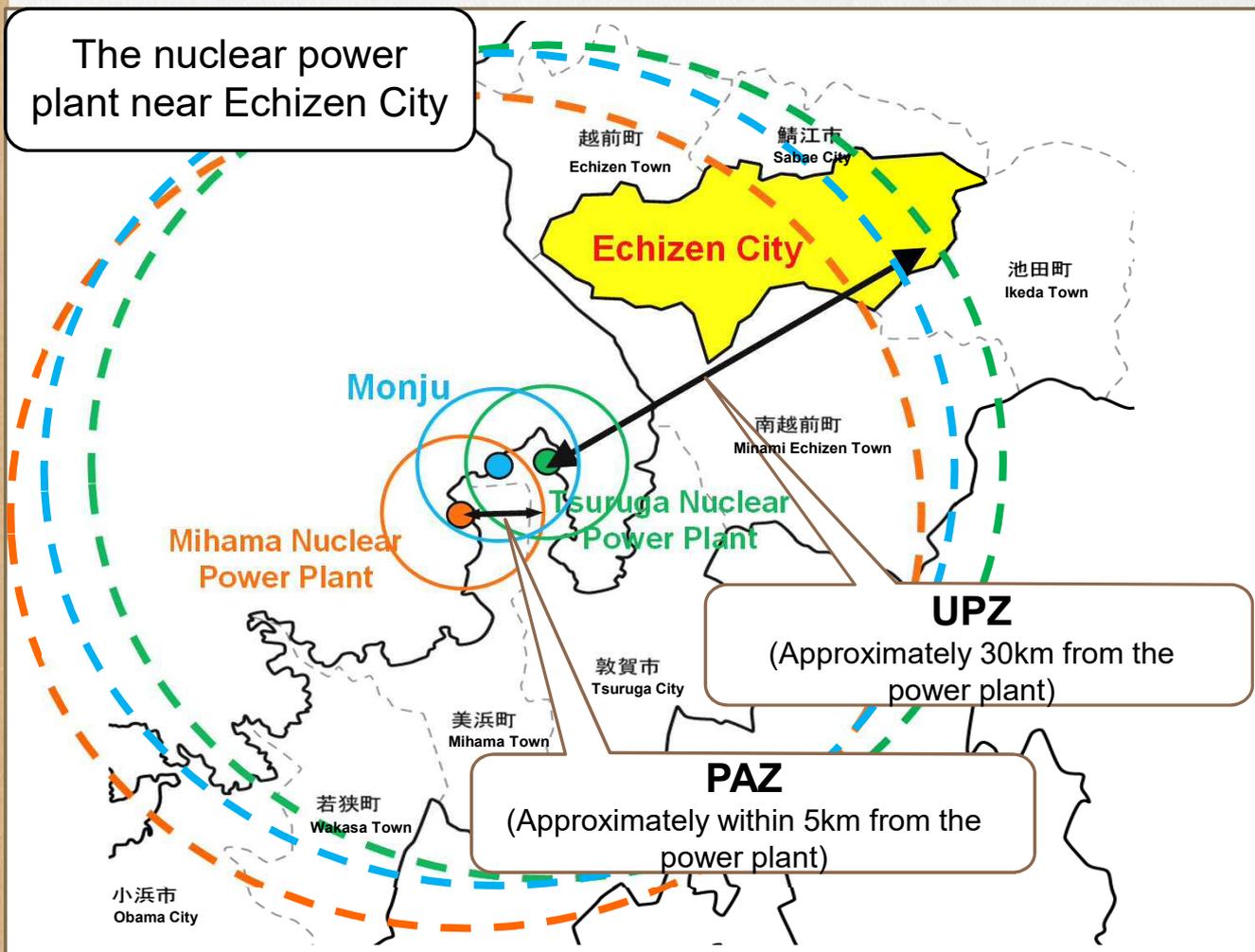
Within an approximate 5km radius from the nuclear power plant.  
Will be evacuated immediately in the event of a nuclear disaster.

**UPZ (Urgent Protective action Planning Zone)**  
(Area to prepare emergency protective measures)

Area within an approximate 30km radius from the nuclear power plant.  
In the event of a nuclear disaster, "shelter-in-place" and "large-scale evacuation" procedures are carried out in stages depending on the amount of radiation.

**★ The entirety of Echizen City is within the UPZ.**

(Residents may have to shelter-in-place or join in the large-scale evacuation)

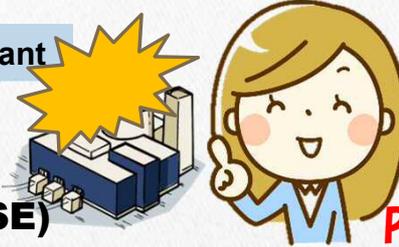


# Course of Action in the Event of a Nuclear Disaster

## Stage 1 Alert (AL)

An accident occurs at a nuclear power plant

Deterioration of the situation



## Stage 2 Site Area Emergency (SE)

Prepare to shelter in your own home, a building, etc.  
(Preparation for sheltering-in-place)

Deterioration of the situation

See p.7 on preparing for sheltering-in-place.

**Pointer!**

Keep an eye out for updates from the city and elsewhere!

(Information available on p.17)

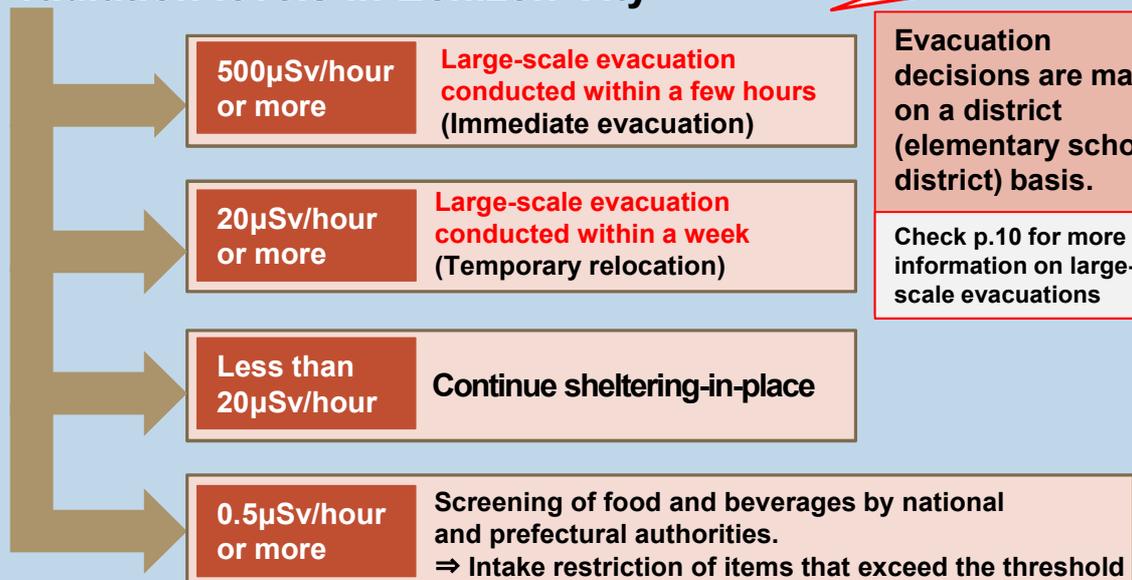
## Stage 3 General Emergency (GE)

Shelter in your own home, a building, etc.  
(Implementation of sheltering-in-place)

Up to this line, no radioactive material has been released from the power plant!

Radioactive materials released from power plant

## Measurement results of airborne radiation levels in Echizen City



Your course of action will vary depending on the amount of radiation!

Evacuation decisions are made on a district (elementary school district) basis.

Check p.10 for more information on large-scale evacuations

\* Standard procedures may not be followed depending on the circumstances at the power plant.

# Shelter-in-Place

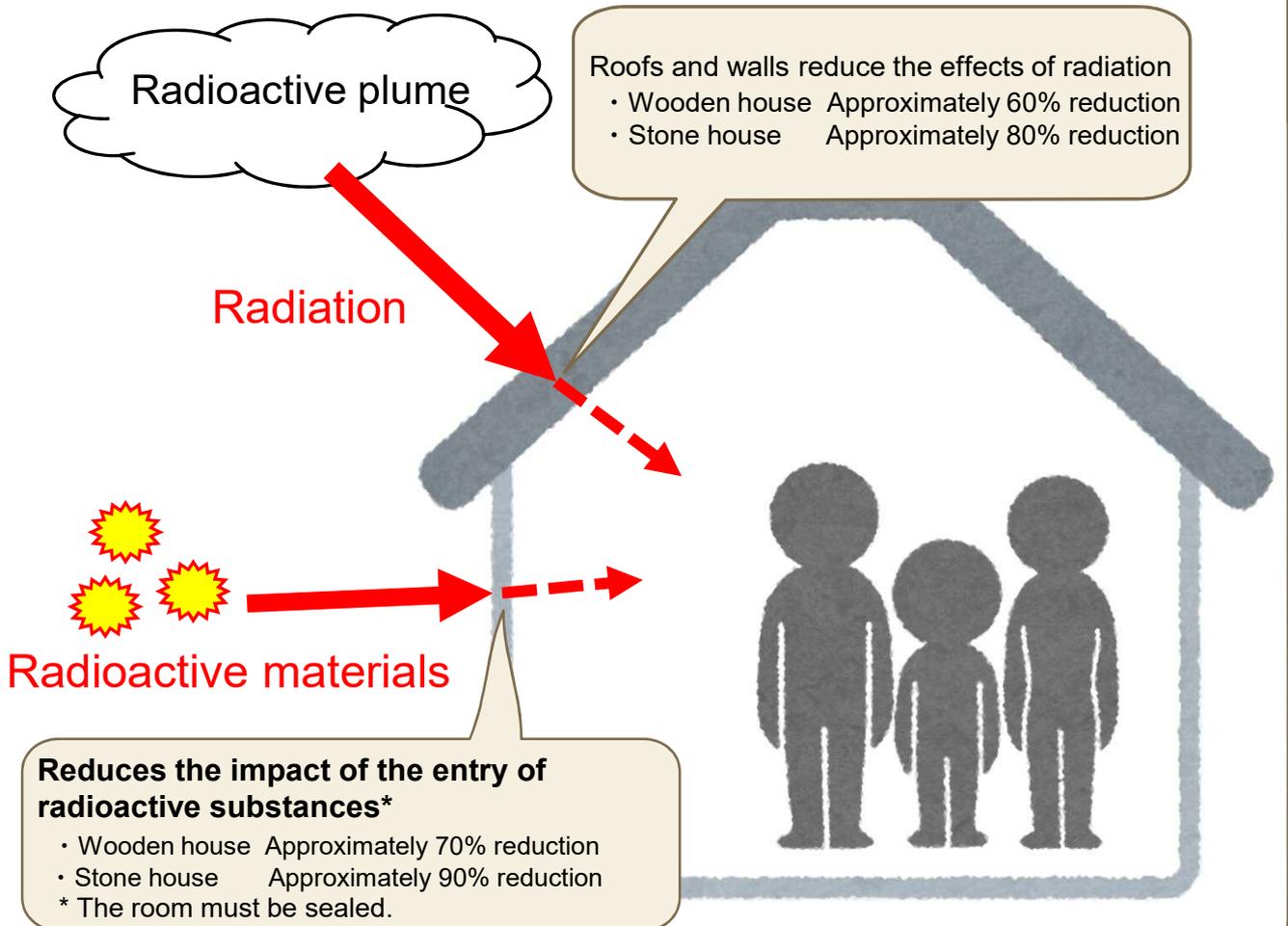
Staying indoors is the first emergency action for the residents in the UPZ area to avoid exposure from the radioactive materials released from the power plant.

Radiation has the ability to pass through objects (p.3). By being inside the building, the roof and walls will block the radiation and thus reduce its effects on the body.

**Please continue sheltering-in-place until you receive a large-scale evacuation order.**

## By sheltering-in-place, you can...

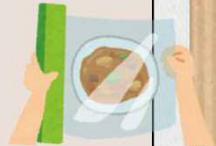
- Reduce external exposure from the radiation outside your house.
- Reduce the the risk of internal exposure due to inhalation airborne radioactive materials.



Source: Nuclear Regulation Authority

"Estimation of Radiation Exposure Doses and Efficacy of Protective Measures during a Nuclear Emergency."

# Shelter-in-Place Checklist ①

- ❑ **Keep calm and go inside your home or another building.**
- ❑ **Wash your face and hands and gargle when returning from outside.**
  - • • Radioactive substances may attach themselves to the surface of the body. Make sure to thoroughly wash them off.
- ❑ **Change and separate the clothes you were wearing into a bag or other containers.**
  - • • When returning home, your clothes may be covered with radioactive materials. Change your clothes and store them in a separate bag or container.
- ❑ **Close the doors and windows to prevent the air from outside entering in.**
  - • • Make sure that they are closed so that airborne radioactive materials do not enter.
- ❑ **Stop using ventilation fans, air conditioners and other equipment that draws in air from outside.**
  - • • Please do not use them as airborne radioactive materials may come in.
  - \* Equipment that does not draw in air from the outside may be used.
- ❑ **Cover or wrap food and store them in the refrigerator, cupboard, etc.**
  - • • Leaving food unattended increases the risk of radioactive materials sticking to them.
- ❑ **Make an effort to obtain new information from the television, radio, etc.**
  - • • Refer to p.17 in order to get the latest information and from Echizen and other cities.
- ❑ **Check evacuation routes in preparation for a large-scale evacuation.**
  - • • Be prepared to act quickly if the instructions for a large-scale evacuation are issued.

 Continued on the next page.



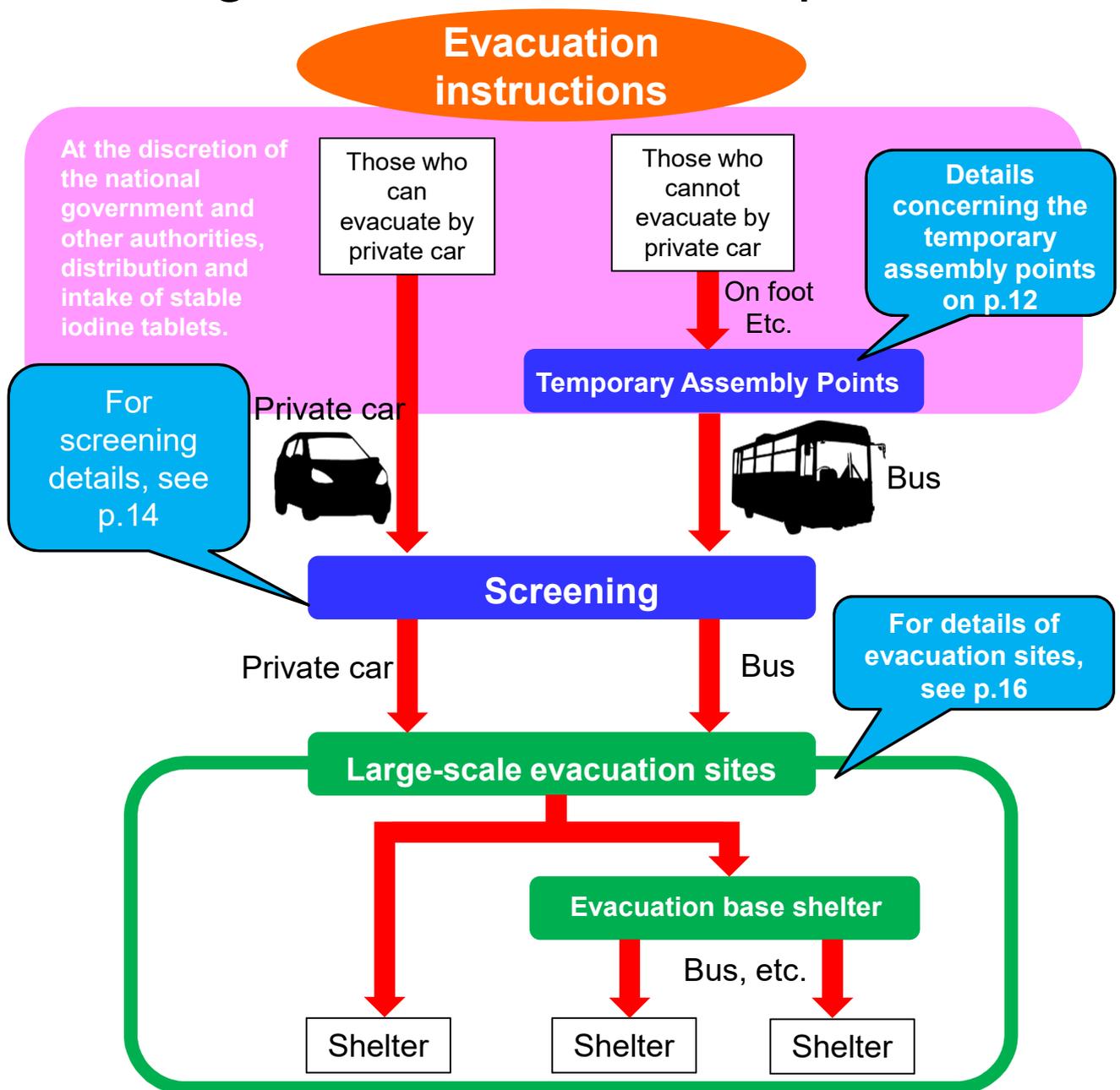
# Large-Scale Evacuation

A large-scale evacuation is an evacuation order from the city from inside the UPZ to outside the UPZ. This is conducted when the situation at the power plant has worsened due to the release of radioactive materials and radiation measurements have exceeded the threshold.

**Large-scale evacuations are conducted by district (elementary school district).**

\* In order to avoid unnecessary congestion and confusion, residents outside the evacuation zone are advised to continue “sheltering-in-place.”

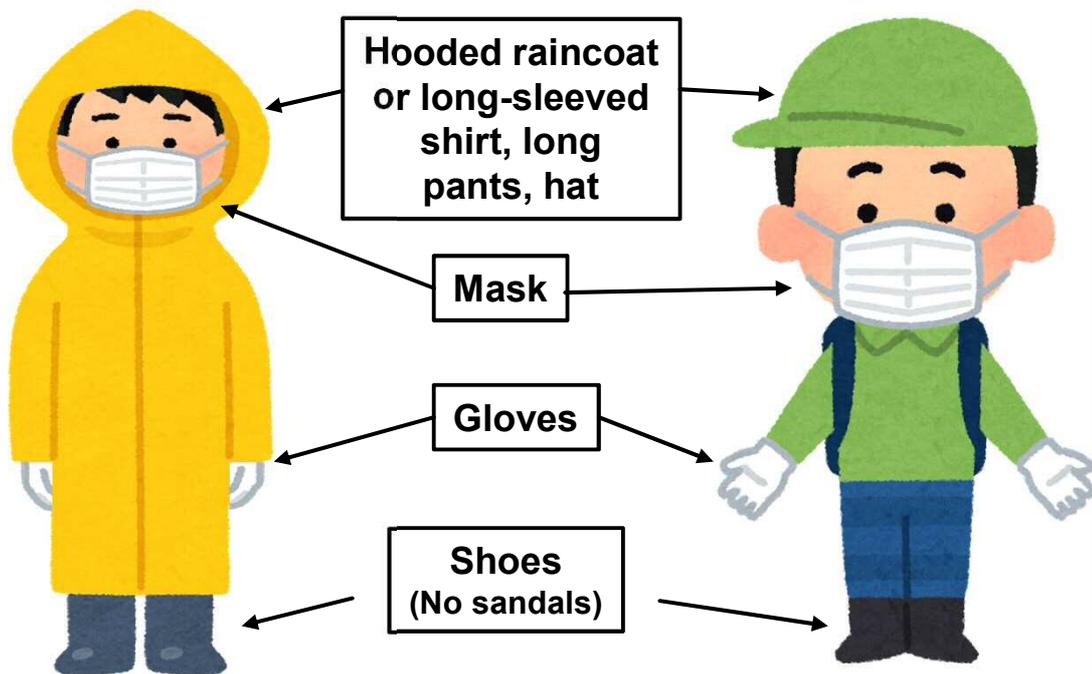
## Large-scale evacuation process



## Checklist Before a Large-Scale Evacuation

- Double-check what you need to bring with you. (Check p.9 again!)**
  - • • This may be a long evacuation. Make sure you have not forgotten anything.
- Switch off your house's circuit breakers and close the main gas tap/cock.**
  - ... Prevent secondary disasters such as fires that may occur while you are away.
- When evacuating, wear comfortable clothes that do not expose your skin.**
  - • • In order to reduce the effects of radiation, wear clothing that exposes as little skin as possible. A raincoat is recommended as radioactive materials can be easily washed should they adhere to it.

[Example of clothing for large-scale evacuations]



- Keep in touch with your neighbors and try to evacuate sharing a car as much as possible.**

# Temporary Assembly Points

A temporary assembly point is a place where residents who are unable to evacuate in their own vehicles can gather to evacuate by bus or other means provided by the prefecture or city.

## Those who cannot evacuate by private vehicle.

As soon as you receive instructions to evacuate from the city or other authorities, collect all the items necessary for evacuation and gather at the temporary assembly point.

### Temporary assembly point in Echizen City

**Each district's elementary school.**  
(The temporary assembly point for Minami-nakayama is Nanetsu Junior High School)

\* As of April 2021

## Those who can evacuate by private vehicle

**You need not gather at a temporary assembly point.**

Please take your vehicle to a screening venue once you are instructed to evacuate by Echizen City or other authorities. (For more information on screening, see p.14)

However, in accordance with the instructions of the national government or other authorities, **"stable iodine agents" may be distributed and asked to be ingested** at temporary assembly points.

In that event, please pay attention to the information from Echizen City as eligible people will need to take the tablets even if they evacuate via private vehicle.

# Stable Iodine agents

One of the substances released from nuclear power plants is radioactive iodine.

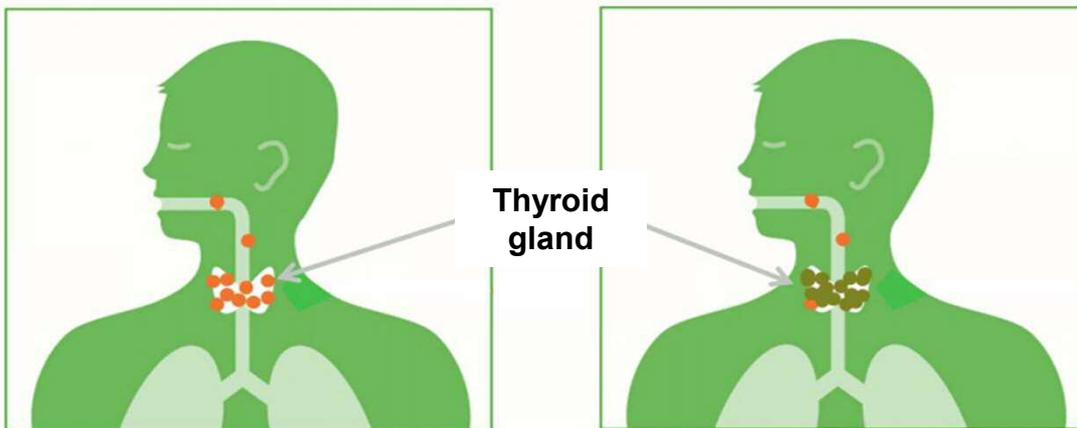
In order to prevent the accumulation of radioactive iodine in the body, **stable iodine agents** are taken as a preventative measure.

\*This cannot reduce the internal nor external radiation caused by radioactive materials other than radioactive iodine.

## Functions and effects of stable iodine agents

Source: NRA (Nuclear Regulation Authority)  
Excerpt from "Mock Briefing for the Pre-Distribution of Stable Iodine Tablets  
(May 23, 2014, July 30, 2014) Handout"

It is possible to reduce the accumulation of radioactive iodine in the thyroid gland by **ingesting** stable iodine agents **within 24 hours** of the absorption of radioactive iodine.



**If not taken**

The build up of radioactive iodine in the body increases the risk of developing thyroid cancer and other diseases.

**When taken in advance**

Accumulation of radioactive iodine in the thyroid gland can be reduced by filling it beforehand with iodine.

- Radioactive iodine
- Stable iodine

### [Distribution venue]

Generally, at **temporary assembly points**

### [Dosage instructions]

Take as directed by your doctor or physician at the time of distribution.

### [Who should not take this medicine]

People with hypersensitivity (allergy) to iodine, a component of stable iodine.

## [Stable iodine agents]

### Pills

Over 3 years old

### Jelly-based

Under 3 years old



Photo courtesy of Fukui Prefecture

# Screening (Inspection During Evacuation)

Screening (inspection during evacuation) is an inspection to check for radioactive materials on private vehicles, clothes and others during a large-scale evacuation of people living in the UPZ.  
(Please see the next page for the inspection process.)

**Everyone must undergo screening** in order to prevent the spread of radioactive contamination.

If the screening shows that the radiation dose is below the threshold, a **Transit Pass** (a certificate of screening) will be issued. The Transit Pass must be presented during reception at the evacuation site.

## Screening venue (candidate sites)

In the event of a large-scale evacuation, facilities along main roads and highway service areas, and such will serve as candidate sites.

\* The venue may change depending on the situation of the disaster.

Please pay attention to the latest information from the city or other authorities.

### Location map of candidate screening sites in Fukui Prefecture



### Candidate site near Echizen City

[Along the highway]

- Kita-Sabae Parking Area (out-bound)

[Along Japan National Route 8]

- Prefectural Industry Promotion Facility (Sun Dome Fukui)
- Prefectural Music Hall (Harmony Hall Fukui)
- Prefectural Industry Hall

[Along Fukui Prefectural Road No.3 Fukui Omori Kono Line]

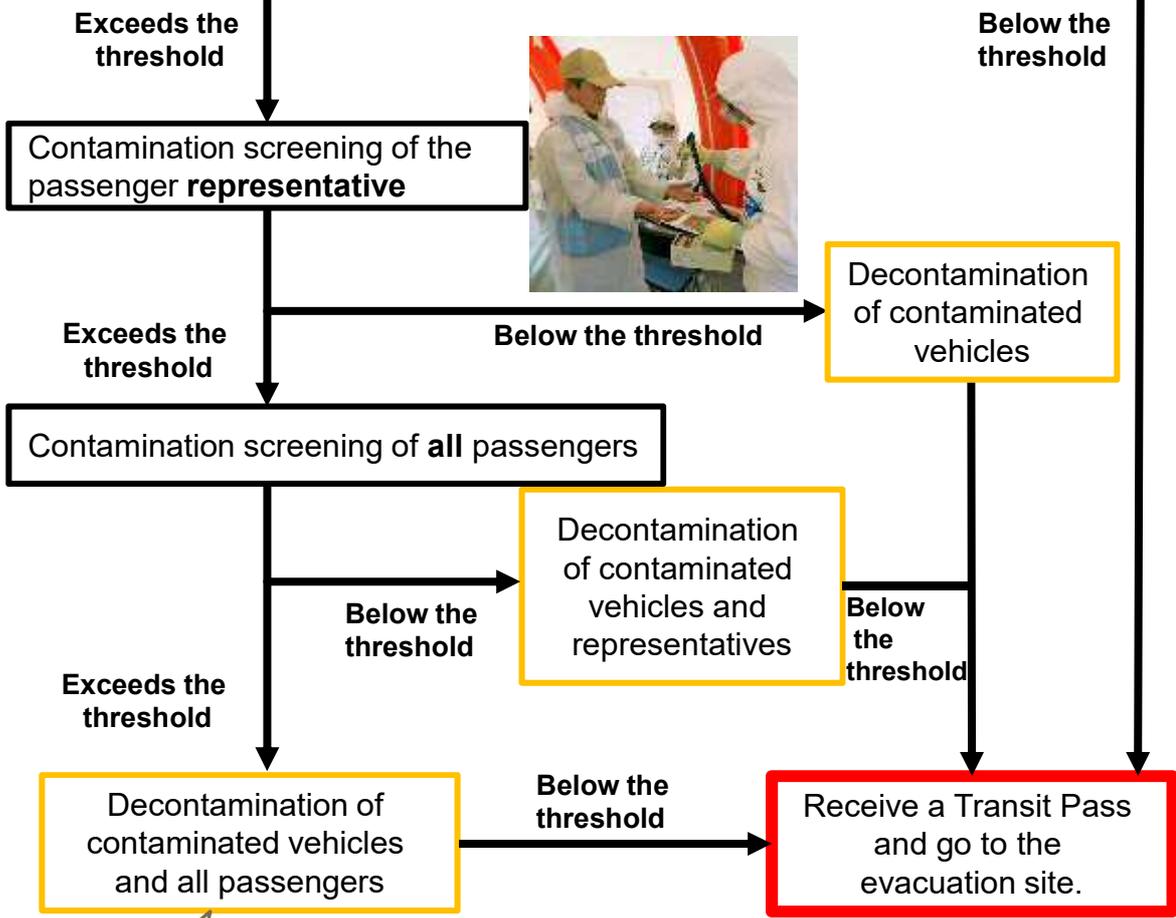
- Fukui City, Kirarakan

Source: Excerpt from "Fukui Prefecture Large-scale Evacuation Guidelines" (revised in November 2018)

# Screening (Inspection During Evacuation)

## Inspection process

Inspection for **vehicle** contamination using a gate-type monitor and other devices.



Do the following for decontamination!

Decontaminating vehicles: Wipe with a damp cloth or wash with running water.

Decontaminating people: When clothes exceed the threshold ⇒ Change clothing

When the body surface exceeds the threshold

⇒ Wipe with a wet tissue or shower.

# Where is the Evacuation Site?

Echizen City is designated four large-scale evacuation sites: **Sakai City; Awara City; Komatsu City, Ishikawa Prefecture; Nomi City, Ishikawa Prefecture.**

An evacuation site will be designated **depending on the area in which you reside.**

If an evacuation base shelter has been designated, please proceed there first.

(\* At evacuation base shelters, private vehicles will be temporarily stored, and people will be guided to evacuation sites.)

You will need to present your Transit Pass upon reception at the evacuation site.

## Large-scale evacuation sites for each district

(as of April 2021)

District name	City name of evacuation site	Evacuation base shelter
<ul style="list-style-type: none"> <li>• Kamiyama, Omushi, Sakaguchi, Oshio, Shirayama</li> <li>• Minami (certain areas)</li> </ul>	<p><b>Sakai City</b> (Fukui Prefecture)</p>	None
<ul style="list-style-type: none"> <li>• Kitahino</li> <li>• Minami (certain areas)</li> </ul>	<p><b>Awara City</b> (Fukui Prefecture)</p>	None
<ul style="list-style-type: none"> <li>• Higashi, Nishi, Yoshino, Kunitaka, Ajimano</li> <li>• Kitashinjo (certain areas)</li> </ul>	<p><b>Komatsu City</b> (Ishikawa Prefecture)</p>	Designated
<ul style="list-style-type: none"> <li>• Awatabe, Okamoto, Minami-Nakayama, Fukuma</li> <li>• Kitashinjo (certain areas)</li> </ul>	<p><b>Nomi City</b> (Ishikawa Prefecture)</p>	Designated

**For specific evacuation sites for each area, please check the QR codes below.** \* Evacuation sites are subject to change.

Please pay attention to the latest information



[Echizen City]  
Echizen City Website  
"Large-scale evacuation site in the event of a nuclear disaster"

[Fukui Prefecture]  
Fukui Prefecture Website  
"Fukui Prefecture Nuclear Emergency Preparedness Net"



Do your research in advance and note it down on the back cover!

# Information Sources

Being informed is important in making decisions that will lead to making appropriate actions. In the event of a disaster, a wide range of information will be transmitted through various forms of media.

Some of these, however, may be hoaxes or rumors.

Know where to get the correct information in order to avoid being misled by rumors and misinformation.

## Collect information from mobile phones or smartphones

Emergency alert email (Area Mail)	Lifeline email (Tannan Cable TV)
<p><b>No pre-registration required.</b> Emails will be sent to mobile phones throughout the city.</p> 	<p><b>Pre-registration required. (Free)</b> Emails such as emergency and crime prevention information will be sent to registrants.</p> 
Yahoo! Disaster Alert (App)	Safety tips (supervised by the Japan Tourism Agency)
<p><b>Downloading the app is necessary. (Free)</b> Disaster information will be sent through the app.</p> <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span data-bbox="188 1816 427 1854">[iPhone version]</span> <span data-bbox="507 1816 754 1854">[Android version]</span> </div>	<p><b>Downloading the app is necessary. (Free)</b> Gives notifications on disaster information in multiple languages.</p> <div style="display: flex; justify-content: space-around;">   </div> <div style="display: flex; justify-content: space-around; margin-top: 5px;"> <span data-bbox="831 1816 1070 1854">[iPhone version]</span> <span data-bbox="1139 1816 1386 1854">[Android version]</span> </div>

## Collecting information from the internet

### Echizen City Homepage



### Fukui disaster prevention signal (Tannan Cable TV)



### Fukui Prefecture Disaster Prevention Net [Fukui Prefecture]



### Nuclear Regulation Authority Homepage 【National Government】



## Other information sources

### Disaster preparedness radio

Broadcasts from speakers installed in various parts of the city (elementary schools, etc.).

If you have difficulties hearing the broadcast, you may call the following numbers to confirm its contents.

- 0778-21-0088
- 0778-21-0091
- 0778-21-0094
- 0778-21-0095

### Announcements by sound trucks

We will also go around the target areas to share invaluable information such as the need to shelter-in-place, or join in a large-scale evacuation.



**Write in advance!!**

**My evacuation site**

City name of **large-scale evacuation site**

Name and address of the **evacuation base shelter**  
(Only where specified)

Name and address of the **shelter**


**Family contact**

Name	Birthdate	Blood type	Phone number	Illnesses/medicine

**Disaster Voice Memo 171 (One Seven One)**

171 is NTT's voice message board service made available during disasters. Please use this service when you are in a disaster area and contacting other people proves difficult due to phone line congestion.

**Record message: 171 → 1 → phone number with area code**

**Play message : 171 → 2 → phone number with area code**