Information in the event of a

Radiation Emergency in Portland Port

What to do if you live nearby

This booklet is important

Please keep in a safe place

This booklet has been produced by Weymouth & Portland Borough Council in cooperation with Dorset County Council, The Ministry of Defence and Portland Port. March 2013.

Weymouth & Portland Borough Council

Dorset County Council

Ministry of Defence

This booklet provides essential safety information to be used in the highly unlikely event of an accident involving the reactor of a nuclear submarine. It is relevant only to those residents living within 1.5 kilometres (0.9 miles) of the part of Portland Port where nuclear submarines occasionally berth, but is being distributed more widely to ensure general public awareness in the area.

The drill in an emergency is simple:

- **Go in**
- **Stay in**
- **Tune in**

Information will be broadcast on:

TV: **BBC1, BBC2, Meridian TV, West Country TV**
Radio: **BBC Radio Solent 96.1 FM & 103.8 FM**
Wessex FM 96 & 97.2 FM

Twitter: **@dorsetforyou**

Follow the instructions you are given.

Although the chance of ever having to use this booklet in an emergency is very slight, please put it in a safe place where you can find it easily.

For more information on radiation safety, call the

South West (South) Health Protection Unit
Tel: **0844 225 3557**

What do you mean by an emergency?

The design of nuclear powered vessels means that an accident involving a vessel's reactor is extremely unlikely. However, if the reactor on board a vessel suffers a serious problem people close to the vessel could be exposed to gamma radiation which is very similar to x-rays.

In some circumstances, it is possible that radioactive material could escape and affect areas close to the submarine or downwind of it.

There is no possibility of a "nuclear bomb" type of explosion.

As soon as the Royal Navy is aware that a nuclear powered vessel in or near the port has a problem, it will start a well-rehearsed emergency plan that it practises regularly with Weymouth & Portland Borough Council, Dorset County Council, Portland Port, the emergency services and the health service.

How do I know if I will be affected?

If an accident occurred, it would probably only affect people living or working very close to or within the port. But the Health and Safety Executive requires people living in an area around the port, at least 1.5 km (0.9 miles) away, to be given the information in this booklet.

The map on the opposite page shows the 1.5km zones.

How will I know an emergency has happened?

There will be an announcement on local radio and television and the advice in this booklet will be repeated. The Police may also issue warnings using loudhailers in the affected areas.

In an emergency

1

Go indoors and stay there

In an emergency the best thing to do is go indoors and stay there. Do not go outside, where levels of radiation could be higher, unless you are told to do so. Keep pets indoors, to stop them from bringing possible contamination into the house. If you are away from home but within the area affected by a nuclear emergency, seek shelter in the nearest building you can, for example a library or shop.

2

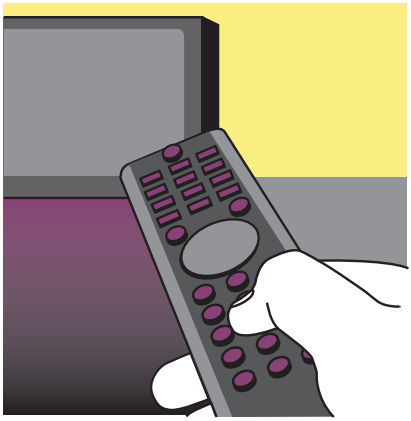
Close all windows and doors

By closing all windows and doors you will reduce the risk of contamination entering the building.

In an emergency

3

Tune in to your local radio or television and follow any instructions you are given.



During a nuclear emergency, information and advice will be given out on your local radio, TV and the internet. Follow any instructions you are given. The back cover lists details of television stations and radio station frequencies. Announcements will be made giving instructions about what to do covering specific issues such as the arrangements being made for the care of children at school, and action to be taken concerning farm animals, foodstuffs, etc.

4

Put out or damp down fires and boilers. SHUT DOWN ventilation devices

Switch off fans, close ventilators and put out or damp down open fires or other heating appliances (such as central heating boilers and gas fires) which draw air from outside. This will help stop possible contamination entering the building.

5

Do not use mobile telephones or landlines unless you need help or advice urgently

In a nuclear emergency, the telephone system may become overloaded, and the emergency services would not be able to contact each other. If you must make a call, please keep it short.

In an emergency

6

Do not leave the area unless you are advised to do so

It is very unlikely that the hazard from a nuclear emergency would require an evacuation outside of the Portland Port site. In any event, staying inside is the most important safety measure, unless you are told by the Police that you need to leave. If an evacuation is necessary, you wil be told about all the arrangements being made at the time. If you have to leave, you should take your pets with you.

7

Take Potassium Iodate tablets ONLY if they are issued to you and you are told to do so

You might hear an announcement on the television, radio or twitter telling you to take Potassium Iodate tablets. These tablets help to protect you from the effects of radioactive iodine which could escape if there is a reactor accident. Staff from the Maritime and Coastguard Agency and Royal Navy will deliver the tablets and a set of instructions to all those premises in the affected downwind area in the event of such an accident. This system of delivery is practised regularly to ensure that the tablets can be distributed to everyone who needs them within a very short time of a nuclear emergency being declared. If you are told to take the tablets, you should continue to remain indoors. The tablets help protect you, but staying inside is still the best protection.

What happens after the warnings are given?

The local authorities will liaise with the Royal Navy and other agencies to deal with the release of information and, as soon as it is completely safe to go outside again, there will be announcements on local radio and TV, and by loudhailer. In the days following the emergency, health experts will carry out checks on the air, water and soil to make sure it continues to be safe. There will be more information in all news media - including the newspapers - on what further action you need to take, if any.
An information helpline number will also be made available. Remember, the risk of this sort of accident happening is extremely remote. But being prepared is nevertheless sensible.

Will we be evacuated?

There would not usually be the need for an evacuation, but if there is an accident, pack the following items and be ready to go just in case:

- Clothing and bedding
- Medicines or special foods you might need
- Private documents and special valuables
- If you have children - baby food, clothing, toys and books
- If you have pets - leads, baskets/carriers, cages and food

Evacuated areas will be controlled, so don't worry if you have to leave your home, it will be safe.

In the event of an emergency, do not leave your home unless advised to do so - the best thing to do is to **stay in**.

I have friends and relatives living in the area but they are further than 1.5 kilometres (0.9 miles) from Portland Port. Should they have the tablets too?

The authorities will continually monitor the situation. If the decision is taken that others outside the 1.5km (0.9 miles) zone require precautionary measures, they will be advised accordingly.

Food and drink

It is unlikely that tap water and any food or drink that you have in your house that is covered and sealed will be affected. Do not use food grown in your garden unless picked before the emergency.

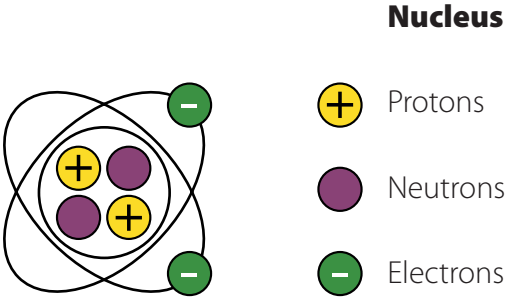
As the emergency is dealt with further information will be given out on local radio and TV stations.

Helpful advice will also be given to farmers, fishermen and other food producers.

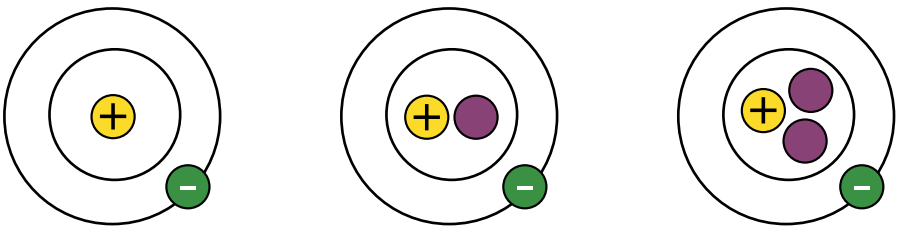
What is radiation?

Atoms

Everything is made up of tiny building blocks called atoms.
Each atom is made up of **electrons** which orbit around a **nucleus**.
This contains **protons** and **neutrons**.
Atoms of the same substance or element have the same number of protons and electrons.



There can be different numbers of neutrons in the same element. An element which has a different number of neutrons is called an **isotope**.



For example, the element hydrogen has the isotopes hydrogen, deuterium and tritium.

When you know the number of protons and neutrons in the nucleus of a specific atom, it is often called a nuclide. An example is the **nuclide** carbon-16, which has 6 protons and 10 neutrons.

Atoms can link together to form **molecules**. Molecules can be made up of atoms of the same element or different elements. The molecule water (H_20) is formed when two Hydrogen atoms join with one Oxygen atom.

Radioactivity and radiation

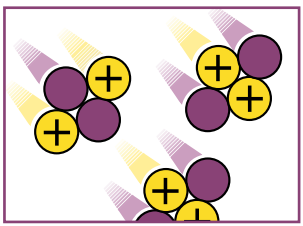
Some atoms are naturally unstable. They can change into atoms of another element by getting rid of some of their protons, neutrons and electrons. When this happens, the atom gives off **radiation**.

An atom is **radioactive** when it changes and gives off radiation.

This change is called decay. An atom which is decaying is known as a **radionuclide**.

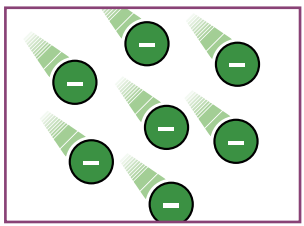
Radionuclides can emit 3 types of radiation:

Alpha radiation



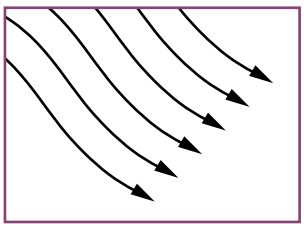
Heavy positively charged particles, each made up of 2 protons and 2 neutrons

Beta radiation



High speed electrons (negatively charged)

Gamma radiation



Similar to X-rays

- As you approach a source of radiation you are increasingly affected the closer you get.

- You can reduce or eliminate the effect by moving away. If you make contact with the source of radiation you can become contaminated.

- You cannot be contaminated with radiation, but you can be contaminated by a substance emitting radiation.

- The effect remains with you until you are "decontaminated", ie the contamination is removed.

How radiation could affect your body

Everybody receives a small amount of natural **radiation**.

Radiation can cause changes to molecules and tissue. One type of change that can be produced is **ionisation**.

For example, ionised water molecules in tissue are chemically very reactive and are called **free radicals**. Free radicals can damage other molecules. Ionisation can also change or affect DNA, the molecule which contains the information used to control our growth and development.

All this can lead to biological effects such as cell changes. It is possible that these changes may not show up until some time after exposure to radiation.

Different types of radiation can cause different effects. Some parts of the body are more sensitive to radiation than others.

Studies have shown that the risk of an effect from exposure to radiation increases with the radiation dose.

Radiation measurement

Quantities and units

The unit by which the amount of radioactivity is measured is the Becquerel

1 becquerel (1 Bq) - 1 atomic disintegration per second

The effect of ionising radiation on the body is measured in sieverts.

The sievert (Sv) is the unit of radiation dose.

The sievert is a large quantity so often the term millisievert or microsievert is used

1 millisievert (1mSv) = 1/1000 Sv

1 microsievert (1µSv) = 1/1000,000 Sv

For comparison 1millisievert is less than 1/2 the average annual dose from natural radiation in the UK. 1microsievert is approximately equal to 1/10 of the dose incurred during a flight from the UK to Spain

Hazards from a radiation emergency

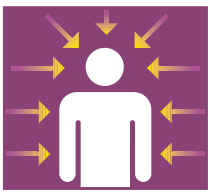
You could be exposed to radiation by:

1. Inhaling contaminated air and gases.
2. Having contact with contaminated surfaces.
3. Eating or drinking contaminated food or water (ingestion).
4. Direct exposure to radiation.

1. Inhalation

2. Contaminated surfaces

3. Ingestion



4. Direct exposure

Countermeasures

These are the actions you can take to minimise the effects of exposure to radiation and contamination as the result of a nuclear submarine reactor accident.

Sheltering by staying indoors is the best way to protect yourself in the short term. Doors and windows should be closed to help stop direct exposure, inhalation and contamination of surfaces inside buildings.

Stable iodine tablets (potassium iodate tablets) can help prevent radioactive iodine from concentrating in the thyroid gland. Issue of these tablets is combined with sheltering and/or evacuation.

Evacuation can help avoid exposure to relatively high doses. It can help protect you from direct exposure and inhalation.

Food bans of milk and other foods may be necessary. This will protect you from ingestion of contaminated foods.

Further information

The Radiation (Emergency Preparedness and Public Information) Regulations 2001 say that this kind of guide has to be updated and distributed every three years to ensure that the public is kept properly informed.

If you would like to find out more about the emergency plan for the area around the port you can find a copy of it at your library and at www.dorsetforyou.com/planandbooklet. It is a called the Portland Port Off-site Reactor Emergency Plan.

You can get more information on radiation from the following websites:

www.hpa.org.uk
www.hse.gov.uk/radiation
www.hmso.gov.uk - search=radiation

Further copies of this booklet can be obtained online at www.dorsetforyou.com/planandbooklet or from:

The Emergency Planning Service
Dorset County Council,
County Hall, Colliton Park
Dorchester, DT1 1XJ
Tel: **01305 224659**

This leaflet is available on request, in larger print, Braille, or tape and is also available in other languages. Please contact Weymouth & Portland Borough Council on **01305 838000**.

Summary advice

For use in the event of a nuclear emergency at Portland Port

If there is a nuclear emergency at the Portland Port site, a wailing siren will sound to warn those people on the Portland Port site. Broadcasts will be made on radio and television to tell people in the immediate surrounding areas what is happening and what they should do.

What to do first

You should read all of this leaflet carefully then tear off this summary and hang it somewhere you can find it easily.

1. **Go indoors and stay there.**
2. **Close windows and doors.**
3. **Listen to local radio or TV. Follow any instructions you are given.**
4. **Put out or damp down fires and boilers. Shut down ventilation devices.**
5. **Do not leave the area unless you urgently need help.**
6. **Do not leave the area unless advised to do so.**
7. **Take potassium iodate tablets ONLY if they are issued to you and IF you are told to do so.**

The "All Clear" signal from the Portland Port site will be given by sounding the siren on a steady note for at least a minute.

Public Information

Radio and Television Stations

Radio: **BBC Radio Solent**
96.1 FM & 103.8 FM
Wessex FM 96 & 97.2 FM

Television: **BBC1**
BBC2
Meridian TV
West Country TV

Twitter: **@dorsetforyou**

Telephone help and advice lines will be set up in an emergency and made public using the above media

Only use the telephone if you need help or advice urgently

GO IN • STAY IN • TUNE IN