

WHAT TO DO IN THE EVENT OF A

# Radiation Emergency

at BAE Systems Submarines and Ramsden  
Dock Basin, Barrow in Furness

This booklet has been prepared for distribution to everyone living and working within the Detailed Emergency Planning Zone (Map on Page 15) of the Barrow BAE Systems and Ramsden Dock Basin Submarine Berths

## EMERGENCY INFORMATION

Tune into local media

[www.westmorlandandfurness.gov.uk/your-environment/emergencies](http://www.westmorlandandfurness.gov.uk/your-environment/emergencies)

Valid until November 2027

**BAE SYSTEMS**

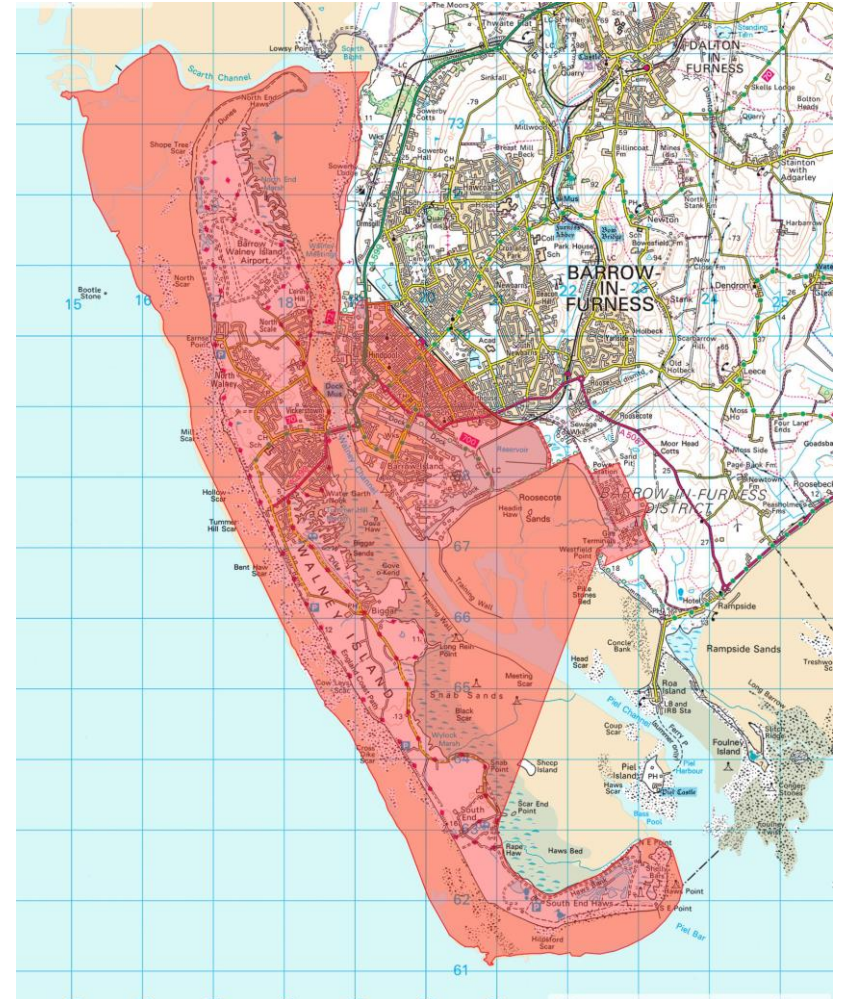
 Westmorland  
& Furness  
Council

## Introduction

**IT IS IMPORTANT THAT YOU KNOW WHAT ACTION TO TAKE SHOULD A RADIATION EMERGENCY OCCUR. THEREFORE IT IS IMPORTANT THAT YOU STUDY THIS BOOKLET CAREFULLY AND KEEP IT IN A SAFE PLACE FOR FUTURE REFERENCE.**

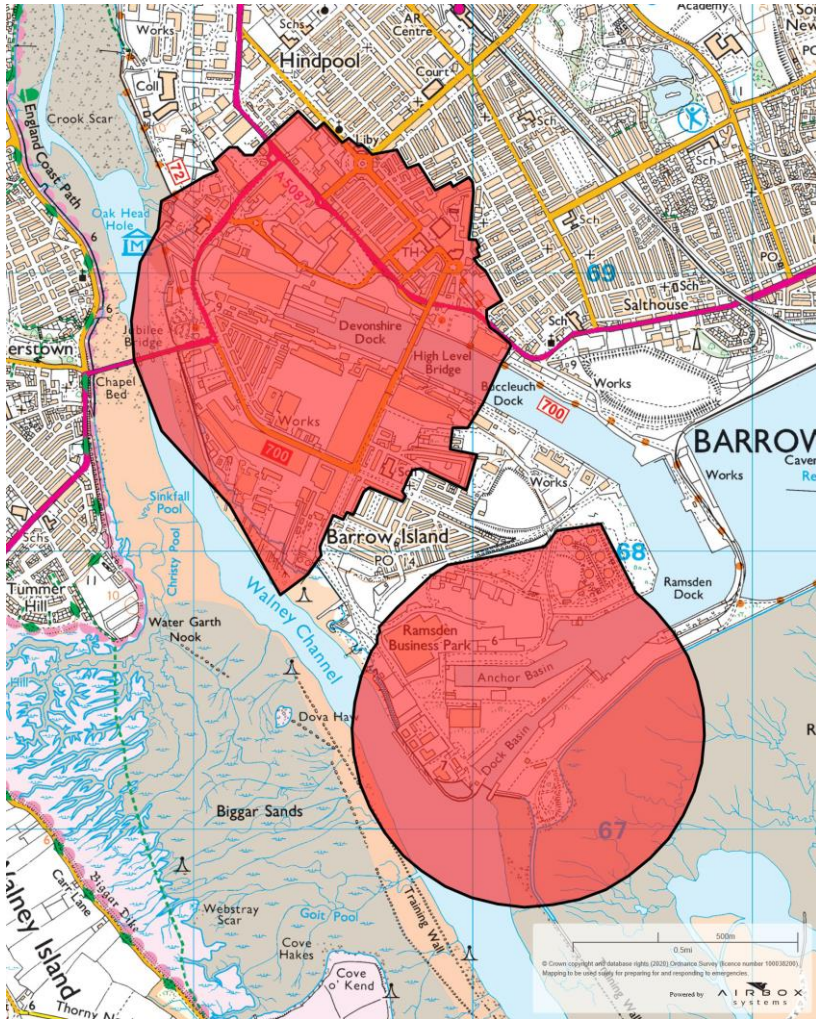
- This booklet provides a simple guide and gives advice on what to do in the unlikely event of a radiation emergency at BAE Systems or Ramsden Dock Basin.
- Nuclear powered submarines have been constructed at the Barrow site since 1959 and there has never been a radiation emergency. It should be emphasised that the possibility of such an event is very remote because the design of all plant is to the highest standards of safety and is independently monitored by the Office for Nuclear Regulation and the Ministry of Defence.
- However, should the highly unlikely occur, there are stages to the development of a radiation emergency with each stage an opportunity for the Emergency Response Organisation to resolve the issue. One stage is the sounding of the Reactor Safety Alert alarm (sounded onsite) and sending personnel home from site. Another stage is declaring radiation emergency. You will be made aware of a radiation emergency by communication from local police and/or the sounding of the Nuclear Alert Siren. There may not initially be a radiation hazard but you should follow the actions within this booklet and advice from the police.
- The BAE Systems site is a working shipyard, you may hear site alarms or see large numbers of personnel leaving site. If you are required to take action the emergency services/police will inform you telling you the appropriate action to take.

## Detailed Emergency Planning Zone



This map gives details of the area within which information is to be distributed, as determined by Cumbria County Council in 2020.

## Pre Distributed Stable Iodine Tablet Area



The shaded areas on the above map are the areas in which stable iodine tablets will be issued in advance of submarine reactor testing.

# Your First Actions

**For use in the event of a radiation emergency at BAE Systems or Ramsden Dock Basin, Barrow-in-Furness**

If you hear the BAE Systems Site Nuclear Alert Siren, or if you receive warning of a radiation emergency from the Police, remain calm and follow this advice.

**1 GO INDOORS AND STAY THERE**



**2 CLOSE DOORS AND WINDOWS**



**3 TRY NOT TO USE TELEPHONES**  
(unless you need urgent help)



**4 TUNE INTO LOCAL MEDIA**  
BBC RADIO CUMBRIA 96.1 MHz FM,  
358m (837KHz) MW  
CandoFM 106.3 FM



**5 DO NOT LEAVE THE AREA**



**6 FOLLOW EMERGENCY SERVICES ADVICE**



More detailed information on the actions above are given on page 4.

## Your First Actions (continued)

### ● SITE NUCLEAR ALERT SIREN

The Site Nuclear Alert Siren (reminiscent of the old air raid siren) is sounded if a radiation emergency occurs on a submarine that could affect the safety of people on the site and, potentially the public. The siren is tested regularly and advance notice is always given in the local newspapers. If you hear the siren (other than during a test) you should follow the advice given below. Please note the siren is not sounded if a radiation emergency occurs at Ramsden Dock Basin; you will be warned by the LOCAL RADIO. Please be aware that there are other site evacuation/incident sirens which may lead to the evacuation of site personnel, you should carry on with your normal activity on hearing these sirens.

### ● GO INDOORS AND STAY THERE

In a radiation emergency, the best thing to do is to go indoors; this will reduce the effects of a radioactive release. If possible, quickly check that your neighbours have also been warned.

### ● CLOSE DOORS AND WINDOWS

If you take care to close all doors and windows, you can greatly reduce any radioactivity in your home. Switch off fans, heating systems, air conditioning and put out open fires.

### ● TRY NOT TO USE TELEPHONES

In an emergency, all telephone systems may become overloaded and this may prevent emergency calls getting through. If you must make a call, please use a landline phone and be brief or send a mobile text message. Please do not make mobile telephone calls.

### ● TUNE INTO LOCAL MEDIA

During a radiation emergency, information and advice will be broadcast on Local Radio: BBC Radio Cumbria 96.1 MHz FM, 358m (837kHz AM) MW, or CandoFM 106.3 FM.

### ● DO NOT LEAVE THE AREA

**Never** be tempted to leave the area unless the Police have told you to do so. You will be much safer indoors. If you are outside, you are more likely to be exposed to radioactivity and if you try to leave you may block the roads for the emergency services.

## Further Details

- Further details on these emergency arrangements can be obtained from:

BAE Systems Submarines  
Resilience Team  
Barrow in Furness  
LA14 1AF  
01229 864150  
www.baesystems.com  
resilience.barrow@baesystems.com

Westmorland and Furness Council  
Cumbria Fire & Rescue Service HQ  
Carleton Avenue  
PENRITH  
CA10 2FA  
www.westmorlandandfurness.gov.uk  
emergency.planning@westmorlandandfurness.gov.uk

- The booklet summarises emergency arrangements contained in the BAE Systems Barrow in Furness Off-Site Emergency Plan.
- This booklet provides information as required under the Government Regulations\*
- This booklet replaces the similar green coloured booklet issued in October 2020 which should now be destroyed. Further copies are available from the addresses above and online at [www.westmorlandandfurness.gov.uk](http://www.westmorlandandfurness.gov.uk)

- This booklet can also be provided in alternative formats such as large print, braille etc. It is also available in different languages. Please contact the Communications Department at BAE Systems at the address above. The booklet is also available on line at [www.westmorlandandfurness.gov.uk/your-environment/emergencies](http://www.westmorlandandfurness.gov.uk/your-environment/emergencies)

\* The Radiation (Emergency Preparedness and Public Information) Regulations 2019

## Food And Water Restrictions

- The Food Standards Agency will issue precautionary advice regarding the safety of food in the early stages of an emergency. Westmorland and Furness Council's Trading Standards Department will, if required by the Food Standards Agency, take appropriate action to prevent the sale of contaminated foodstuffs to the public.
- Mains water supplies would not initially be affected by a release of radioactivity and water for drinking etc. should be drawn fresh from the tap.
- If you have a private water source, where possible, use alternative supplies until the safety of your water has been confirmed.
- The Environment Agency, United Utilities and Westmorland and Furness Council Environmental Health Officers will arrange for sampling to be carried out and will issue advice concerning the safety of drinking water supplies.

## What Could Happen?

### RELEASE OF RADIOACTIVITY

- An emergency could occur when the nuclear reactor in a submarine is being operated. This takes place for only very short periods of time on a few occasions during each submarine build.
- In the event of an accident, radioactivity should be contained within the submarine but it is possible that some could be released and this could affect areas close to the submarine and downwind.  
**At no time could there ever be the possibility of a nuclear bomb type explosion.**
- Radioactive material released in an accident could affect people in any of the following ways:
  - by breathing in some of the material
  - by direct radiation from the atmosphere or material deposited nearby
  - by eating or drinking contaminated foodstuffs.
- The environment around the Site or Ramsden Dock Basin will be monitored for radioactivity and if necessary the following countermeasures will be introduced:
  - sheltering
  - evacuation
  - taking stable iodine tablets
  - restrictions on the consumption of locally grown produce, milk and water.
- The possibility of any immediate effect on health following a serious accident at BAE Systems or Ramsden Dock Basin is extremely remote. However, there may be an increased risk to health that would not become evident for many years. The purpose of the countermeasures listed above is to make these risks as small as possible.

# Radioactivity and Radiation

- Everything is made up of tiny building blocks called atoms. Each atom is made up of **electrons** which orbit around a **nucleus** that contains **protons** and **neutrons**.
- Atoms of the same substance or element have the same number of protons and electrons. Some atoms are naturally unstable. They become stable by getting rid of their protons, neutrons and electrons.
- Radioactivity is defined as “the spontaneous emission of radiation from an unstable atom”. This process is called radioactive decay.
- There are three 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, they penetrate further.
- 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. The effect remains with you until you are “decontaminated” i.e. the contamination is removed.

# Evacuation

- If the Police advise you to evacuate from the area they will direct you to a Reception Centre, such as a local school, where you can stay until the emergency is over. The Police will tell you where the Reception Centre is.
- Use your own transport, if possible, and go directly to the Reception Centre. If travelling by car, keep all windows closed and turn off the heater and ventilation.
- If you have space in your vehicle, please take any neighbours who don't have their own transport.
- If you do not have transport, the Police may ask you to walk to an assembly point from where a bus will take you to the Reception Centre.
- Check your next-door neighbours have been warned; if you know of anyone who is vulnerable, and who might have difficulty during the evacuation, please help them. If you are unable to do so, inform the Police.
- Do not delay except to gather essential medicines, etc. Stable Iodine tablets will be available at the Reception Centre if they are required.
- If your children are at school during an emergency, you will naturally want to collect them as soon as possible; however, it may not be safe to do so. They will be looked after as a priority group either at the school or evacuated to a safe place where they will be looked after by the school staff and those responding to the emergency. Please listen to local radio for advice and details of the arrangements that have been made.
- If you wish to stay with friends or relatives elsewhere you will of course be free to do so. However, it is vital that you register at the Reception Centre first, so that if someone asks the Police about you, they will be able to confirm that you are safe.
- If you bring pets to the Reception Centre in a car, please leave them in the car but do not fully close all the windows; arrangements will be made for them.
- Re entry to any evacuated areas during the emergency will normally be restricted by the Police to persons having compelling reasons for doing so. Arrangements could be made, for example, for essential feeding of livestock if safe to do so.

## Take Stable Iodine Tablets

- During the emergency you will be advised if you need to take pre distributed stable iodine tablets.
- If there has been a release of radioactive iodine, the tablets work by 'filling up' the thyroid gland with ordinary iodine to block the intake of the radioactive iodine. The tablets are very small and the easiest way to take them is with a drink. They are unlikely to produce side effects.
- Tablets will be distributed to all households and businesses in the areas shown on the map on page 14 and Schools, Care Establishments and Childcare Facilities within the area shown on the map on page 15. If you have not been issued with tablets and need to take them, stocks are held locally and details of distribution arrangements will be broadcast on local radio stations during the emergency.
- Dosage is as follows:  
Adults: 2 tablets  
Children (3-12 yrs): 1 tablet  
Children (1 month-3 yrs): ½ tablet, crushed and mixed with milk, water or jam.  
Newborn babies (0-1 month): ¼ tablet crushed & mixed with milk or water.
- **Do not take stable iodine tablets unless told to do so.**
- Do not take stable iodine tablets if you are allergic to iodine or have one of the following rare medical conditions:  
Hypocomplementaemic vasculitis, dermatitis herpetiformis, Stage 4 or 5 kidney failure and pregnant women suffering with Thyrotoxicosis
- Very young babies (less than 3 months old) and women more than 6 months pregnant should take the tablets as directed in the leaflet that will be issued with the tablets, but should thereafter be seen by their GP who will arrange for any necessary checks to be undertaken by a paediatrician.
- Further information about the tablets is available on the leaflet distributed with the pack.

## How radiation could affect your body

- Radiation can cause changes to molecules and tissue in the body. 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 other parts of the body. Studies have shown that the risk of an effect from exposure to radiation increases with radiation dose.

## Radiation Measurement

- The unit by which the amount of radioactivity is measured is the **becquerel**.  
**1 becquerel (1Bq) – 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) = 1/1000Sv**  
**1 microsievert (1uSv) = 1/1000000Sv.**
- For comparison 1 millisievert is less than half the average annual dose from natural radiation in the UK. 1 microsievert is approximately equal to 1/10 of the dose incurred during a flight from the UK to Spain.

# What you might need to do

## Shelter

Shelter in your own home or, if you are in the open, in the nearest building. See page 9 for step by step advice about what to do.

## Take Stable Iodine Tablets

You will be advised to take them. See page 10 for more details.

## Evacuation

To a Reception Centre. See page 11 for step-by-step advice about what to do.

## Follow advice on Food and Water Restrictions

Appropriate action will be taken by the relevant authorities to prevent the sale of contaminated foodstuffs to the public. Advice will also be given concerning the safety of drinking water supplies. See Page 12 for more details.

## At the End of the Emergency

Information concerning the end of the emergency will be broadcast on local radio and television.

# Shelter

- Sheltering provides effective short-term protection from breathing in radioactive material in the air. It also gives protection from direct radiation from radioactive material in the air or on the ground.
- Quickly check that your neighbours have been warned and then immediately go indoors and stay there.
- Close all doors and windows, and switch off ventilation fans, air conditioning and heating systems. Put out all open fires.
- If your children are at school during an emergency, you will naturally want to collect them as soon as possible; however, it may not be safe to do so. They will be looked after as a priority group either at the school or evacuated to a safe place where they will be looked after by the school staff and those responding to the emergency. If they are needed, stocks of stable iodine tablets for staff and children are held at schools within the emergency planning area for the Wet Dock Quay and Ramsden Dock Basin (please see the Emergency Map on page 15 for this area). Please listen to local radio for advice and details of the arrangements that have been made.
- Stay tuned to local radio and await Police instructions. If the Health Service decides you need to take stable iodine tablets, details will be broadcast on local radio.
- The Police will tell you when it is safe to go outside again.