Report to Sizewell Site Stakeholder Group

February 2019

This report covers the Environment Agency's regulation of Sizewell A & B nuclear sites and related issues for the period between October 2018 and January 2019.

Our Regulation

We regulate radioactive waste disposals to the environment. We do this through environmental permits that contain limits and conditions aimed at minimising wastes and protecting the environment. We check compliance with the permits by making regular inspections at Sizewell A & B.

Radioactive Substances Compliance Assessment Reports (RASCARs) detailing our inspections and any non-compliances found are placed on the Public Register.

We also regulate and control other activities through our environmental permits, including surface water discharges to surrounding water bodies and emissions to air from emergency diesel generators. We are also the joint technical authority, alongside the Health & Safety Executive for the Control of Major Accident Hazard (COMAH) regulations that apply to Sizewell B.

Current Regulatory Activities

Sizewell A

Bradwell Care and Maintenance.

We visited Bradwell on 7th November and Sizewell A on 13th and 14th November to carry out readiness inspections to see if Bradwell can enter care and maintenance (C&M) from an environmental perspective. We did not pick up anything that would prevent C&M entry from our view point. We fed our opinion back to the Office of Nuclear Regulation who permissioned C&M entry at the end of November.

We found that Sizewell A have sufficient resources and systems to be able to take over environmental compliance at Bradwell. We also took part in the Magnox audit on the environmental compliance golden thread. This was the last ONR test to be carried out to measure C&M preparations. The audit did not pick up any major issues.

Inspections.

We undertook an inspection of the Sizewell Environmental Monitoring Programme (EMP) on 11th/12th September for both Sizewell A and B stations. This included witnessing some environmental samples being taken. From a Sizewell A perspective we found that the Operator had a good working relationship with Sizewell B in terms of managing the arrangements of their Environmental Monitoring Programme and the two sites communicate well together. We made some minor recommendations to the Operator to ensure that the more formal management system arrangements between the sites are kept up to date. There were no non-compliances.

Sizewell B

Inspection of Sizewell Environmental Monitoring Programme

We undertook an inspection of the Sizewell Environmental Monitoring Programme, which involves a wide range of environmental samples to assess and provide reassurance of the impact of radiological discharges from the stations to the surrounding environment.

This was a joint inspection of both the Sizewell A station (Magnox) and the Sizewell B Station (EDF).The programme has been undertaken by Sizewell B since the 1st of July 2015, on behalf of both stations, as a requirement of their environmental permits.

From the inspection we determined that the Environmental Monitoring Programme at Sizewell B was well managed. Equipment was maintained and staff involved in the execution of the programme were competent and knowledgeable. The station were compliant with the requirements of their environmental permit, with no non-compliances identified.

We noted some good practice with the stations commitment to ensuring that it's counting equipment was accurate through their participation in external verification testing, using national radionuclide

standards. In addition the environmental technicians underwent thorough on the job training in all aspects of the environmental monitoring programme sample collection and analysis.

Joint Inspection on Higher Activity Waste with ONR

We undertook a joint inspection of the EDF HAW arrangements and a site inspection of Sizewell B, in conjunction with the Office for Nuclear Regulation (ONR) in January 2019. We found that SZB were applying the Best Available Techniques (BAT) to the management of HAW. We were reassured that the station were not foreclosing potential future waste options through their management of the waste. No non-compliances were noted.

SZB radioactive substances environmental permit now varied.

We issued an administrative variation to the Sizewell B Radioactive Substances Regulation (RSR) Environmental Permit (EPR/XB3539DH) at the end of November 2018. The variation was initiated by the operator, to remove a gaseous discharge disposal outlet from their permit, after routing the discharge route into a larger outlet at the station. This will remove reliance on some redundant monitoring equipment. The discharge limits will remain the same.

The permit is due to undergo an Environment Agency initiated variation in March 2019.This is to include new conditions that will require SZB to develop and maintain a Waste Management Plan (WMP) and a Site Wide Environmental Safety Case (SWESC) in line with the joint environment agencies' guidance document 'Management of radioactive waste from the decommissioning of nuclear sites: guidance on the requirements for release from radioactive substances regulation' (known as the GRR).

Enforcement

We have taken no enforcement action and noted no non-compliances during the period October 2018 – January 2019 for Sizewell B. There was some minor non-compliances against the permit identified at SZA as detailed below.

Error in submitting gaseous discharge returns

In October 2018 we were informed by the Operator that there had been an error in the gaseous discharge returns from Sizewell A for quarter 2 2018 (submitted in July 2018). Whilst the actual discharges reported were correct, the rolling 12 month cumulative totals for radionuclides in the gaseous discharges contained an error. The cause of the error was inadequate communication between team members after a potential error trap had been discovered when reporting the quarter 1 2018 figures. The Operator relied solely on communication between team members rather than formal logging of the potential error for future returns. The error in the quarter 2 returns was spotted during the process for reporting the quarter 3 2018 returns.

We require Operators to report data to us in the manner and timescales that we specify. As there was an error in the quarter 2 returns, the correct figures were submitted late. Also the error trap should have been logged more formally rather than relying on communication between 2 team members. We gave 2 non-compliances against the permit for the event. As there was no environmental impact involved, these breaches were classed as category 4 (the lowest level) and our enforcement response was to give advice and guidance. The Operator has put measures in place to prevent a reoccurrence.

Discharge Reports

The operators at Sizewell A and B are required to report liquid and gaseous discharges to the environment to us on a regular basis. These reports are placed on the public register.

Liquid and gaseous discharges from both Sizewell A and Sizewell B sites were at levels well within permitted limits and no Quarterly Notification Levels (QNLs) were exceeded in the period.

Other News

On 19th December 2018, BEIS published the policy paper, Implementing Geological Disposal: Working with Communities: An updated framework for the long-term management of higher activity radioactive waste. This document sets out the Government's overarching policy framework for managing higher activity radioactive waste through implementing geological disposal and how they will work with communities to find a location for a geological disposal facility (GDF). Alongside this policy paper, the Government also launched a new national consent-based process in England to find a site to host a GDF. Radioactive Waste Management Limited (RWM) is responsible for implementing geological disposal and they will lead the siting process.

The Environment Agency will regulate a GDF jointly with the Office for Nuclear Regulation (ONR). The Environment Agency is responsible for making sure that the developer and operator of a geological disposal facility (GDF) in England meets the high standards we have set to protect people and the environment, both now and in the future. Our role is described in more detail at: https://www.gov.uk/guidance/regulating-the-geological-disposal-of-radioactive-waste-environmental-protection. The Environment Agency

will not be involved in the decision to select a potential site for a GDF although we will be available to provide information and advice to communities on environmental protection.

If you require further information about our role, or if you would like to be on our mailing list, you can contact us by e-mail: nuclear@environment-agency.gov.uk.

Publication of RIFE Report.

The annual "Radioactivity in Food and the Environment" (RIFE) report presents results of the national monitoring programmes conducted by the Environment Agencies and the Food Standards Agency. These monitoring programmes support our regulatory function and provide reassurance that public radiation exposures are within legal limits. The report was published on 25th October 2018 and can be found here: www.gov.uk/government/publications/radioactivity-in-food-and-the-environment-rife-reports

This is the 23rd edition of RIFE containing information on radiation exposures (doses) to the public and radioactivity levels in the environment during 2017. It covers locations near to nuclear fuel production and reprocessing sites, research establishments, nuclear power stations, defence establishments, radiochemical production, industrial and landfill sites, and non-nuclear sites. It also reports on regional monitoring away from these sites, which provides data on background radiation levels.

The report for 2017 shows that total doses to the public, from permitted discharges and direct radiation around nuclear sites, remained well below the legal limit of 1000 µSv per year.

The unit for measuring radiation dose is the Sievert (Sv); 1 Sv is a very large dose. A more convenient unit to use is micro Sieverts (µSv) and 1 µSv is one-millionth of a Sv (0.000001 Sv).

At Sizewell, results showed that total radiation dose (from all pathways and sources of man-made radiation) to the most exposed person were similar in 2017 to those reported in previous years at less than 20 µSv per year.

For comparison, a typical chest x-ray gives the patient a radiation dose of around 100 µSv and a dental x-ray around 5 µSv.

Error in RIFE 23.

An error in the RIFE report was found after printing concerning the measurement of strontium 90 in marine sediment (page 148). Due to the sensitivities shown previously to strontium 90 issues at the site stakeholder group we have created some frequently asked questions to cover any queries that may be raised and reassure stakeholders. The levels of strontium 90 reported in RIFE are very low and are of negligible risk to the public and the environment. We have attached the frequently asked questions to the end of this report.

We sometimes pick up small amounts of radioactivity in the environment. The Operators at Sizewell A and B and ourselves carry out the environmental monitoring programmes to ensure that any levels that are picked up are assessed and action taken if required. There are no issues to the public from the levels measured in RIFE 23.

A correction to RIFE will be made in the next report in October 2019.

Release of Sites from Regulation.

The Environment Agencies in England, Scotland and Wales have published new Guidance on Requirements for Release from Radioactive Substances Regulation (GRR) offering extra options in agreeing interim and final end states. We expect to vary Permits for each site this year which will require submission of plans in order to demonstrate that environmental protection standards are maintained now and into the future.

A non-technical summary can be downloaded from the internet: www.sepa.org.uk/media/365894/grr-non-technical-summary.pdf

UK Strategy for Radioactive Discharges.

The 2018 review of the 2009 UK strategy for radioactive discharges has now been published:

www.gov.uk/government/publications/uk-strategy-for-radioactive-discharges-2018-review-of-the-2009-strategy

The 2009 strategy laid out the UK Government policy on radioactive discharges: that the unnecessary introduction of radioactivity into the environment is undesirable, even at levels where doses to humans and other species are low and, on the basis of current knowledge, are unlikely to cause harm.

This publication is a review of outcomes and discharge profiles, and is not a new strategy, nor a revision of the overall approach to radioactive discharges. It takes account of developments in UK Government policy, commercial decisions within the nuclear industry, technological advances and improvements in our knowledge of the impacts of radionuclides in the marine environment.

The review demonstrates evidence of progress against the strategy outcomes (not to be misinterpreted as targets), and the objectives of the OSPAR Radioactive Substances Strategy.

EA Support to Sizewell SSG

We continue to support the Sizewell SSG and stakeholders are welcome to contact us with any queries or issues they may have

We have found it increasingly difficult to attend SSG meetings in the Sizewell area over the course of the last year because meetings have either been cancelled or rescheduled at short notice.

For efficiency we include the announced SSG meeting programme dates as a factor that helps us schedule our inspection activities. When SSG meeting dates are cancelled or rescheduled at short notice we hope the SSG will understand that it may not be possible for us to attend.

Contacts

The Environment Agency's Regulators for the Sizewell A and Sizewell B sites are Phil Fahey and Victoria Thomas respectively. Phil and Victoria are both Nuclear Regulators and part of the Nuclear Regulation Group (South) which is based at the Environment Agency's Wallingford office in Oxfordshire.

Phil and Victoria undertake environmental regulation of radioactive substances on nuclear licensed sites in southern England and Wales. They work closely with the local Environment Agency teams in those areas as well as external bodies such as the Office for Nuclear Regulation.

Address: Environment Agency
Red Kite House
Howbery Park
Wallingford
Oxfordshire
OX10 8BD

Email:

phillip.fahey@environment-agency.gov.uk

victoria.thomas@environment-agency.gov.uk

Telephone

Phil Fahey: 020 302 59732

Victoria Thomas: 020 847 47381

www.gov.uk/Environment-Agency

Frequently asked questions. Error in reporting of strontium-90 results in marine sediment in RIFE 23.

What is RIFE 23?
The annual 'Radioactivity in Food and the Environment' (RIFE) report presents results of the national monitoring programmes conducted by the Environment Agencies and the Food Standards Agency. These monitoring programmes support our regulatory function and provide a check that public radiation exposures are within legal limits. The report was published on 25th October 2018 and can be found here:
https://www.gov.uk/government/publications/radioactivity-in-food-and-the-environment-rife-reports
This is the 23rd edition of RIFE containing information on radiation exposures (doses) to the public and radioactivity levels in the environment during 2017. It covers locations near to nuclear fuel production and reprocessing sites, research establishments, nuclear power stations, defence establishments, radiochemical production, industrial and landfill sites, and non–nuclear sites. It also reports on regional monitoring away from these sites, which provides data on background radiation levels.

What is strontium-90?
Strontium-90 is a fission product, which emits beta radiation. Beta radiation is a form of radiation that can be blocked by a thin sheet of metal or similar thin barrier.
Other beta emitters include potassium-40, which is a naturally occurring radionuclide.

Where has the strontium-90 come from?
Strontium-90 is present in the environment from a number of sources. Environmental samples will include a 'background' contribution from nuclear accidents and historic atmospheric weapons testing as well as from nearby discharges such as nuclear sites or hospitals. In hospitals it can be used for the treatment of cancers.

Why are you measuring strontium-90 in marine sediment?
Measuring strontium-90 in marine sediment is already part of the environmental monitoring programme at Sizewell A. In 2017 we decided to add to our own environmental monitoring programme around Sizewell. We decided that we would measure strontium-90 along with the other radionuclides already being measured in the marine sediment samples that we take.
The ponds at Sizewell A are due to be drained in 2019. We want to monitor strontium-90 during this drain. Marine sediment can act as a "sink" for radioactivity in the environment and we wish to perform our own monitoring to ensure the protection of the public and environment. We started the programme in 2017 so we could get some baseline measurements before the pond drain commenced.

Where and how often are you measuring strontium-90 in marine sediment?
We added strontium-90 measurements to samples already being collected by us at Aldeburgh, Minsmere and Southwold. We normally take samples twice a year, in quarter 1 and quarter 3. This was the frequency of sample collection in 2017.

What did you measure in 2017?
The measurements in 2017 were as follows;
Aldeburgh: Below detectable limits in quarters 1 and 3.
Minsmere: Below detectable limits in quarters 1 and 3.
Southwold: 10.5 Bq/kg plus or minus 4 Bq/kg in quarter 1 and below detectable limits in quarter 3.
Levels of detection were 2 Bq/kg.
The samples are measured in Becquerel's (Bq) per kilogramme (kg) i.e. Bq/kg.

Why is there a difference in the Southwold results?
There could be a number of reasons. The levels of strontium-90 that we are looking to detect are very small being around the levels of instrument detection. At such low levels the results can be influenced by laboratory procedures, the nature of the sample (is it more silty or sandy) or how mixed the sample is (does the sample taken have the same consistency throughout).

What is the issue with RIFE 23?
Normally we would take an average value of results from throughout the year. The result for Southwold of 11 Bq/kg does not take into account the quarter 3 sample. The result should have been reported as less than 6.25 Bq/kg.

Can people still use the areas where these samples were taken?
Yes. The amount of strontium-90 detected is extremely low and represents a very small amount of the radioactivity routinely found in the environment. Radioactivity is measured in Becquerels. The samples are measured in Becquerels per kilogram.

What does 6.25 Becquerel per kilogramme mean?
6.25 Becquerels per kilogram is a very small amount of radioactivity. 1 kilogram of Brazil nuts can contain more radioactivity from natural sources. The human body contains around 4-5,000 Becquerels of the radioactive isotope potassium-40, which also emits beta radiation.

The National Radiological Protection Board (now part of Public Health England) has previously published generalised derived limits for certain radionuclides in the environment.
The document can be found here.
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/501934/vol_9_no_1_1998_for_publication.pdf
To reach the annual dose limit for a member of the public from a radioactive source (1 millisievert), a person would have to be exposed to 3,000,000 Bq/kg of strontium-90 in the marine sediment environment. The levels outlined here are significantly below this figure. (Note: on average a person in the UK will receive approximately 2.5 millisieverts from natural background radioactivity).

Has strontium-90 been found in the environment around Sizewell before?
Yes. The Sizewell A environmental monitoring programme has occasionally seen similar levels of strontium-90 in their results for marine sediment i.e. around the detectable limits.

Could the strontium-90 have come from Sizewell A?
Yes it is possible that the Strontium-90 came from Sizewell A. The Environment Agency ensures that the public and environment are protected by issuing permits to control the amount of radioactivity discharged from sites. The environmental permit issued to Sizewell A allows them to make discharges of strontium-90. These discharges are well below the levels discharged when the site was an operating station generating electricity. We carry out routine compliance inspections to scrutinise how the Sizewell A site is complying with their environmental permit. The Sizewell A site operates well within its discharge limits and we find that the overall level of regulatory compliance and environmental performance of the site is good.

Are you going to be measuring strontium-90 in the future?
Yes. We will continue with our programme. We also review the environmental monitoring programme for the Operators of both Sizewell A and B to determine if there are any issues that would affect the public and the environment.

We have received the result of the Southwold analysis for quarter 1 2018. The result for strontium-90 in marine sediment was less than the detectable level (level of detection 2.2 Bq/kg).

Are you going to correct RIFE 23?
Yes. A correction will be published. This will be around the same time as we publish the RIFE report for 2018, in October 2019.

If the levels are so low and are not an issue to the public and the environment why are you telling us about the error in RIFE 23?
We are an open and transparent organisation and we want to ensure that our customers and any interested stakeholders have the best and the most correct and up to date information as possible.