Sizewell C Project

Radioactive Substances Regulation (RSR) Permit Application

Appendix H – Cross Reference to Environment Agency Guidance and GDA UK EPR™ Documentation

This page has been intentionally left blank

1 INTRODUCTION

The inclusion of GDA information is included as an intrinsic part of the UK EPR™ design and documentation. As described elsewhere in the RSR permit application, the GDA for the UK EPR™ has been completed, additionally the site-specific design for the twin unit UK EPR™ site at Hinkley Point C has been permitted and is undergoing construction.

As explained throughout this document this application is made at an early stage in the development of the Sizewell C nuclear power station to support the planning process. There are a number of items that cannot yet be resolved but are recorded on the Forward Work Plan (FWP) and will be resolved on the appropriate timescales indicated, as agreed with the Environment Agency.

There are recognised differences between the GDA PCER, HPC permit and the RSR permit application but these are due to:

- Site-specific aspects;
- Operator-specific aspects; and
- Potential caveats identified during the GDA assessment.

Table H-1 below identifies the source of GDA PCER and HPC PCSR information which has been used in the RSR permit application here for Sizewell C.

Table H-1 Cross reference to guidance and sources of information

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
1 Other applications: Tell us if you have recently made, or you intend to make, an application for an environmental permit to operate a regulated facility, other than a radioactive substances activity, on the premises. This will enable us to coordinate our determination work.	Application forms	n/a
2 About the activities **2a What activities are you applying for?** Tell us which radioactive substances activities you are applying for. A nuclear site licensee does not need a permit to keep or use radioactive material on the premises, but a tenant on a nuclear licensed site does.	Application forms	n/a
2b Is a submission to the European Commission under Article 37 of the Euratom treaty required for these activities? • Details of when Article 37 applies are set out in the 2010 Commission Recommendation (2010/635/Euratom) • Your submission should be made to the Department of Energy and Climate Change (DECC) who will send it on to the Commission.	Application forms	n/a

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
2c Provide a technical description of your activities Your description should include: • The overall function of the facility in which you carry out the radioactive substances activities; • its main plants, systems and processes; and • identification of the plants, systems and processes which have a bearing on radioactive waste generation, treatment, measurement, assessment and disposal.	100115743 Head Document Section 2	1.2 & 6.3

2c Provide a technical description of your activities
 	
• How radioactive wastes will arise, be managed and disposed of throughout the facility's lifecycle, including:
  ○ sources of radioactivity and matters which affect wastes arising;
  ○ gaseous, aqueous and other wastes;
  ○ discharge points for gaseous wastes and discharge routes for aqueous wastes; and
  ○ disposal routes for other wastes.
	100115743 Head Document Section 2	6.1, 6.2, 6.3, 6.4 & 6.5

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
3 Operating techniques Describe how you manage the production, discharge and disposal of radioactive waste to protect the environment and to optimise the protection of people. You should: • Describe your optimisation process; and • identify and justify the techniques you are proposing as best available techniques (BAT). In identifying techniques, you should address both the technology you use and the way your facility is designed, built, maintained, operated and dismantled. In justifying techniques as BAT you will need to address the following, in respect of wastes arising throughout the lifetime of the facility: • preventing and minimising (in terms of radioactivity) the creation of radioactive waste; • minimising (in terms of radioactivity) discharges of gaseous and aqueous radioactive wastes; • minimising the impact of those discharges on people, and adequately protecting other species; • minimising (in terms of mass/volume) solid and non-aqueous liquid radioactive wastes; • selecting optimal disposal routes (taking account of the waste hierarchy and the proximity principle) for those wastes; and • the suitability for disposal of any wastes you create for which there is no currently available disposal route (ILW and HLW) and how you will manage them in the interim so as not to prejudice their ultimate disposal.	100198762 - Support Document A1 – Environment Case & 100197505 - Support Document A2 – Integrated Waste Strategy	8

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
4 Disposal of radioactive waste **4a Provide quantitative estimates of:** • discharges of gaseous and aqueous radioactive wastes; • arisings of combustible waste and disposals by on-site or off-site incineration; and • arisings of other radioactive wastes (by category and disposal route (if any)). For gaseous and aqueous radioactive wastes, you should estimate your monthly discharges: • on an individual radionuclide basis for significant radionuclides; • on a group basis (for example 'total alpha' or 'total beta') for other radionuclides; and • via each discharge point and discharge route (as identified in your response to question 2c). 'Significant' radionuclides are those which: • are significant in terms of radiological impact for people or non-human species; • are significant in terms of the quantity of radioactivity discharged (that is, numerically high); • have long half-lives, may persist and/or accumulate in the environment, and may contribute significantly to collective dose; and • are significant indicators of facility performance and process control. For combustible and other radioactive wastes, you should estimate the annual arisings and disposals during operation. You should also give an indication of the likely arisings during decommissioning. You should identify wastes in terms of their category (HLW, ILW, LLW), physico-chemical characteristics and proposed disposal route (if any). Quantification should be in terms of activity of key individual radionuclides and overall groupings of radionuclides (for example, total alpha), together with mass and/or volume.	100198811 - Support Document B – Discharge Limits for Radioactive Waste & 100115743 - Head Document - Section 4	6.3 &6.5

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
4b Provide your proposed limits for: • gaseous discharges; • aqueous discharges; • disposal of combustible waste by on-site incineration; • disposal of waste by transfer off-site (by waste type and transfer route); and • any other disposal route (except on-site disposal of solid waste to land). Provide your proposals for annual limits (on a rolling twelve-months basis for gaseous and aqueous discharges, and a calendar year basis for other disposals) and tell us how you derived these. They should be consistent with the information you provided in response to question 4a and reflect your likely operations over the next five to ten years. For discharges, they should take account of: • "Statutory guidance to the Environment Agency concerning the regulation of radioactive discharges into the environment" (DECC, 2009); You may additionally propose 'campaign' limits, where appropriate. For example, if your operations (and consequent discharges) are cyclical or on a batch basis, you might want to propose limits for a complete cycle, or for one or more batches.	100198811 - Support Document B – Discharge Limits for Radioactive Waste	6.3

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter

5 Monitoring
 	
5a Provide a description of the sampling arrangements, techniques and systems for measurement and assessment of discharges and disposals of radioactive waste
 	
Your description should:
 	
• include details of your in-process monitoring arrangements, as well as those for your final discharges and disposals;
• demonstrate your proposals represent the best available techniques for monitoring;
• confirm the sensitivity is sufficient to:
  ○ readily demonstrate compliance with the proposed limits; and
  ○ for nuclear power reactors or reprocessing plants, meet the levels of detection specified in EU Commission Recommendation – 2004/2/Euratom.
 	
Further guidance is given in "Standardised reporting of radioactive discharges from nuclear sites".
	100199173 - Support Document C1 – Plant Monitoring	7 & 8

5b Provide a description of your environmental monitoring programme You should provide your proposed environmental monitoring programme for: • the operational phase of your facility; and • establishing a pre-operational baseline (or provide the results of this if already completed). Your operational programme should take account of the guidance in Radiological Monitoring Technical Guidance Note 2 – Environmental radiological monitoring	100199174 - Support Document C2 – Environmental Monitoring	11.4

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
6 Radiological assessment **6a Provide a prospective dose assessment at the proposed limits for discharges and for any on-site disposal** (such as incineration, but not on-site disposal of solid waste to land) Your dose assessment should include: • annual dose to most exposed members of the public for aqueous discharges; • annual dose to most exposed members of the public for gaseous discharges (identifying separately the dose associated with on-site incineration where applicable); • annual dose to most exposed members of the public through the groundwater pathway, if you are proposing to dispose of radioactive waste into the ground; • annual dose to the most exposed members of the public for all discharges from the facility; • annual dose from direct radiation to the most exposed member of the public; • annual dose to the critical group for the facility; • potential short-term doses, including via the food chain, based on the maximum anticipated short-term discharges from the facility in normal operation; • a comparison of the calculated doses with the relevant dose constraints (taking account of any historical and future discharges from other facilities in the locality where appropriate); • an assessment of whether the build-up of radionuclides in the local environment of the facility, based on the anticipated lifetime discharges, might have the potential to prejudice legitimate users or uses of the land or sea; and • collective dose, truncated at 500 years, to the UK, European and world populations.	100197432 - Support Document D1 – Human Radiological Impact Assessment	10 & 11

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
You should tell us which model(s) you used to calculate these doses and why they are appropriate, and set out all the data and assumptions (with reasoning) that you used as input into the model(s) including: • radionuclide composition of each discharge; • chemical form of each radionuclide discharged; • gaseous discharge points details (including location, heights, effective heights and volumetric flow rates); • aqueous waste discharge points details; • proportions of discharges made via each discharge point (including incinerators); • data used to estimate incinerator discharges (including quantities of waste to be incinerated, expected radionuclide composition and concentrations, retention factors for any abatement provided); • hydrographic data (mean volumetric flow for inland water courses or volumetric exchange rate for estuaries/coasts); • location of dose receptor points; • weather data; • deposition velocities, washout coefficients and surface roughness factors; • dose per unit intake factors; • food consumption rates; • critical group habits data; • nearest food production location; • nearest habitation; and • hydrogeological and soil data, if you are proposing to dispose of radioactive waste into the ground. Your assessment should take account of the principles and guidance in "Principles for the Assessment of Prospective Public Doses arising from Authorised Discharges of Radioactive Waste to the Environment", August 2012		

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
6b Provide an assessment of the impact of the radioactive discharges and on-site disposals on non-human species You should assess the dose-rates to reference organisms that result from your proposed discharges (including any indirect input to groundwater you propose). An appropriate range of reference organisms for freshwater, marine and terrestrial ecosystems is included in the ERICA tool. You should calculate worst-case dose-rates by assuming the presence of the reference organisms for the relevant ecosystem at the position of maximum environmental concentration due to discharges (usually, close to the site boundary for the terrestrial ecosystem, and close to the point of discharge for aquatic ecosystems). Tell us which model you used to calculate these dose-rates and why it is appropriate, and set out all the data and assumptions (with reasoning) you used as input into the model, where not already covered in question 6a. You should compare the assessed dose-rates with our guideline value of 40 microGy/hour (the level below which we consider there will be no adverse effect on non-human species). Note that, the Environment Agency will: • assess the combined impact of discharges, from your and all other relevant permitted sites, on each potentially affected Natura 2000 site; • compare those combined impacts with the 40 microGy/hour guideline value.	100199175 - Support Document D2 – Non-Human Biota Radiological Impact Assessment	10 & 11

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
6c Provide an assessment of the impact on people and non-human species of the environmental studies Only answer this question if you are applying for an activity described in Schedule 23, Part 2, paragraph 11(5)(b)	n/a	n/a
7 Receiving radioactive waste Provide details of the origin, nature and quantity of each waste stream to be accepted onto the premises, and how you will manage and dispose of it.	100115743 - Head Document - Section 3	n/a
8 Radioactive material Only answer this question if you are a tenant applying for an activity described in Schedule 23, Part 2, paragraph 11(2)(a) involving unsealed sources.	n/a	n/a
9 Mobile radioactive apparatus for environmental studies Only answer this question if you are applying for an activity described in Schedule 23, Part 2, paragraph 11(5)(b).	n/a	n/a
Further Relevant EA Guidance		

Relevant RSR B3 Guidance Requirements	Relevant SZC RSR permit application document	Principal GDA PCER Sub -Chapter
Management arrangements are not described in the B3 Guidance as they are defined in the Application for an environmental permit for a radioactive substances activity, Part RSR-A – About you and your premises. You must have an effective, written management system in place to achieve compliance with the conditions of any permit we may issue to you. You must send us a summary of your management system or, if you are a nuclear site licensee, your management prospectus. We have provided guidance on management systems in: • Radioactive substances regulation: management arrangements at nuclear sites; • Guidance on the production and use of an integrated management prospectus; and • Our non-nuclear 'How to comply' guidance. Tell us whether your management system is accredited and under what scheme or standard.	100115743 - Head Document - Section 7	n/a

This page has been intentionally left blank