EDF ENERGY

Our Ref.: HNB20591R

Keith Hammond
RS Specialist
SEPA
Angus Smith Building
Maxim 6
Parklands Avenue
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HOLYTOWN
ML1 4WQ

6th December 2013

Dear Mr Hammond

Certificate of Authorisation RSA/A/0070022.

Our current Authorisation for radioactive waste disposals imposes certain detailed restrictions relating to the nature of waste materials that can be disposed and the locations and / or operators of facilities to whom waste can be consigned. Individual facilities that receive and process or dispose of radioactive waste are also regulated regarding the volume and activity of consignments.

There are an increasing number of facilities within the United Kingdom and abroad which could process and or dispose of radioactive waste materials and we wish to be able to consider use of these. We hereby request that SEPA review or appropriately vary the current authorisation in order to facilitate use of other such facilities. We recognise that any such variation would include conditions that require any such receiving facility to be appropriately permitted.
(Note that EDF Torness are making a similar request under cover of letter TOR13/046R)

I enclose a copy of a report produced by EDF Corporate which has been approved within the Hunterston B Document Control Systems in order to explain further.

If you require any further clarification please contact Andy Taylor on 01294 826266 in the first instance.

Yours sincerely

Paul Forrest, Plant Manager

Colin Weir
Station Director

Enc. HPS/TSSD/ES/DR2240

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EDF Energy Nuclear Generation

Hunterston B

Application to vary Hunterston B Power Station's Certificate of Authorisation Allowing for the Disposal of Radioactive Waste

Originated by:	George Dickie Environment Officer	Date: 05/07/2013
Reviewed by:	Lorna Stevens Environment Officer	Date: 05/08/2013
Reviewed by:	George Thomson Environmental Safety Engineer	Date: 28/11/2013
Reviewed by:	Andrew Taylor Environmental Safety Group Head	Date:
Approved by:	John Morrison Technical and Safety Support Manager	Date:

Contents

1 Introduction

1.1 Company Overview

EDF Energy is one of the UK's largest energy companies. It is the UK's biggest producer of electricity providing power to a quarter of the country's population. With a current installed capacity of around 16.5GW, it supplies gas and electricity to over 5.5 million business and residential customers from our nuclear, coal and gas power stations, as well as combined heat and power plants and wind farms.

EDF Energy employs nearly 20,000 people at locations across the UK. The combined companies are part of EDF S.A, one of Europe's largest power companies.

The nuclear generation part of the business was formally known as British Energy Generation Ltd. British Energy Generation Ltd de-listed from the London Stock Exchange on 3 February 2009 and is now EDF Energy Nuclear Generation Ltd, a subsidiary of EDF Energy.

For simplicity from this point in the document the name 'EDF Energy' is used to mean 'EDF Energy Nuclear Generation Ltd'.

1.2 Station Overview

Hunterston B Power Station was commissioned in 1976 and is currently planned to continue operation until 2023. Hunterston B Power Station has an electrical output of approximately 900 MW, which is enough to power 1.5 million homes. The power station is located south of Largs, Ayrshire, on the west coast of Scotland.

1.3 Application Purpose

Hunterston B Power Station is authorised under section 13 of the Radioactive Substances Act 1993 to dispose of radioactive waste. This activity is carried out in accordance with a certificate of authorisation (Ref 1) issued by the Scottish Environment Protection Agency (SEPA), which allows EDF Energy to dispose of radioactive waste.

This document supports EDF Energy's application to vary the certificate of authorisation for Hunterston B Power Station as follows:

- Removal of some of the constraints placed on transfers of radioactive waste generated at Hunterston B Power Station off-site to third parties for treatment and/or disposal.
- Introduction of the ability to receive waste for the purposes of interim storage and onward disposal.
- Update the company name appearing on the authorisation to 'EDF Energy Nuclear Generation Limited'

These changes will:

- Help EDF Energy to reduce stored waste and make effective use of the waste management hierarchy.
- Establish a common approach to regulation of EDF Energy's power stations
- Implement the changes described in the SEPA Policy on the Regulation of Disposal of Radioactive Low Level Waste (LLW) from Nuclear Sites (Ref 2) which allows for

the transfer of LLW to any third party authorised to receive it. The policy does not limit the quantity of LLW that can be transferred off-site.

1.4 Document Structure

This document provides the information required by SEPA's application form for site's wishing to vary their authorisation to dispose of radioactive waste. The document is structured as follows:

- Section 2: clarifies the scope of the variation application.
- Section 3: explains in detail what change are proposed, the benefits of doing this and demonstrates that there will be no significant environmental impact from these changes.
- Section 4: provides details of the wastes that would be affected by the proposed changes.
- Appendix A1: provides a map of Hunterston B Power Station.
- Appendix A2: provides an extract from the existing authorisation showing the existing limitations.

2 Scope

The scope of the variation application is limited to:

- Removal of some of the constraints placed on transfers of radioactive waste generated at Hunterston B Power Station off-site to third parties for treatment and/or disposal.
- Introduction of the ability to receive waste for the purposes of interim storage and onward disposal.

EDF Energy is not applying to vary the parts of the existing authorisation for Hunterston B Power Station that control discharges of radioactivity to a water body or the atmosphere. It is EDF Energy's expectation that these aspects of the current authorisation for Hunterston B Power Station will remain the same.

3 Variation Application

3.1 Background

In recent years there has been a growth in the number of companies in the UK and overseas able to offer radioactive waste treatment and disposal services.

EDF Energy has identified that some of these new treatment and disposal routes represent the 'best practicable means' (BPM) for certain radioactive wastes currently stored at Hunterston B Power Station. For example use of metal decontamination and recycling services which allow useful resources to be recovered rather than being sent for disposal (i.e. better use of the waste management hierarchy).

Effective and timely use of these new waste treatment and disposal services is currently frustrated by the conditions and limitations in the current authorisation, which reflect historic waste management practices in the UK.

This has been recognised as an issue in the SEPA Policy on the Regulation of Disposal of Radioactive Low Level Waste from Nuclear Sites which now states that SEPA will authorise the disposal of LLW from nuclear sites to any person that is lawfully entitled to accept and to treat or dispose that waste. Apart from limiting this disposal option to LLW, there will be no additional activity or volume constraints. SEPA believes that the environmental permissions of the receiving facility are the most appropriate method of controlling quantities of waste that may be managed by that facility.

The following sections provide in more detail:

- Requested changes to the authorisation, including comment on how this will help with the disposal of wastes and application of the waste hierarchy;
- Further reasons and benefits of making the requested changes to the authorisation;
- Assessment of the environmental impact of the proposed changes.

3.2 Requested Changes

Table 1: sets out the requested changes to the RSA93 authorisation for Hunterston B Power Station.

Table 1: Requested Changes

Activities Allowed under the Current Authorisation	Requested Change	Comment
Radioactive waste can only be transferred off-site to specified locations.	Variation to enable LLW to be transferred off-site to any site authorised to receive it for treatment and disposal.	These changes would enable reduction in the volume of waste accumulated on site and more effective application of the

Activities Allowed under the Current Authorisation	Requested Change	Comment
Only LLW can be transferred off-site. The authorisation does not allow Intermediate Level Waste (ILW) to be transferred off-site.	Variation to enable ILW to be transferred off-site to the destinations[1] listed below, where it can be treated to produce a final waste form that is categorised as LLW and is suitable for disposal: • Incinerator, Hythe, UK • Metal treatment facility, Lillyhall, UK • Waste treatment and processing site, Winfrith, UK • Incinerator, Elsmere Port, UK • Incinerator, Slough, UK • Incinerator, Dessel, Belgium • Metal treatment facility Krefeld, Germany • Incinerator and Metal Treatment Facility, Nykoping, Sweeden • Incinerator and Metal Treatment Facility, Tennessee, USA • Other UK incinerators • Other overseas incinerators and metal treatment plants • Any UK and overseas radioactive treatment facilities which become available at a future date	waste management hierarchy.
Radioactive wastes that can be transferred off-site are subject to annual activity limits set for individual radionuclides and groups of radionuclides.	Variation to enable radioactive waste to be transferred off-site to any appropriate site that is authorised to receive it regardless of: • Radionuclide composition • Specific activity • Total activity	The current authorisation prevents ILW oils from being disposed within reasonable timescales. The proposed change would address this.

[1] SEPA policy requires the destinations of intermediate level waste to be specifically named on the authorisation.

Activities Allowed under the Current Authorisation	Requested Change	Comment
Radioactive waste transferred off-site must be in one of the following forms: • Solids • Organic liquids •	Variation to enable the radioactive wastes to be transferred off-site to any appropriate site that is authorised to receive it regardless of: • Physical characteristics • Chemical characteristics	The current authorisation prevents wet wastes which often contain an aqueous component, such as sludges and IX resins (see Section 4.2 for more details), from being transferred off-site for treatment and disposal. The proposed change would address this.
The existing authorisation does not provide for Hunterston B Power Station to receive transfers onto site of radioactive waste.	Variation to enable Hunterston B Power Station to receive radioactive waste from other EDF Energy power stations for the following purposes: • Interim storage • Loading of containers • Onward transfer There will be no processing or treatment of waste that has been transferred to Hunterston B Power Station from another site. There will therefore be no impact on Hunterston B Power Station's gaseous or liquid discharges. There will also be no long-term storage of waste transferred to Hunterston B Power Station from another site.	The proposed change would enable better implementation of the waste management hierarchy and help EDF Energy implement centralised approach to the management of radioactive wastes where there are currently no available disposal routes.
Change the name appearing on the from of the authorisation from 'British Energy Generation Ltd' to 'EDF Energy Nuclear Generation Ltd'.		

3.3 Reasons / Benefits for the Requested Changes

Table 2: provides further reasons and benefits for making the requested changes to the authorisation

Table 2: Reasons / Benefits for the Requested Changes

Reason / Benefit	Comment
Enable disposal of waste	• Hunterston B Power Station currently has an inventory of waste stored on site which has viable disposal routes but cannot be disposed of within reasonable timescales due to its radioactive or physical characteristics. These changes would allow for a reduction in the volume of waste accumulated on site.

Enable more effective implementation of the waste hierarchy	• Allowing transfers to any site authorised to receive radioactive waste would provide access to novel radioactive waste treatment services which feature higher up the waste hierarchy than current routes, for example metal decontamination and recycling • Allowing waste to be received at Hunterston B Power Station would enable EDF Energy to combine similar waste arsings from other EDF Energy stations to form a joint consignment. This would be an improvement on the current situation where, due to an insufficient volume of a particular waste stream at an individual site, waste can be consigned via a route which features lower down the waste hierarchy.
Reduce carbon emissions from transfer of waste off-site	• Removing constraints on activity would allow there to be a lower number of larger sized waste consignments, which would reduce 'waste miles', transport fuel use and carbon emissions.
Reduce the number of future variation applications	• As the UK nuclear industry works to implement the UK's national low activity radioactive waste strategy (Ref 3) more radioactive waste disposal services will become available. Should this variation be successful it would avoid the need to vary the authorisation each time a new route becomes available.
Alignment with SEPA policy	• SEPA's policy on the regulation of disposal of radioactive low level waste from nuclear sites (Ref 2) encourages a move away from naming specific third parties a consignor can use in their authorisation

3.4 Environmental Impact of the Changes

3.4.1 Emissions

The proposed changes would have no impact on the gaseous and aqueous discharges from Hunterston B Power Station.

The management of radioactive waste transfered to third parties would remain subject to regulatory scrutiny through the site's RSA 93 authorisation requirement to apply Best Practicable Environmental Option (BPEO) and Best Practicable Means (BPM) techniques to minimise the activity and volume of waste generated and select the most appropriate disposal strategy (ref 4). In addition waste transferred to another site would need to meet the waste acceptance criteria (WAC) of the site receiving the waste which are also regulated by an appropriate regulator. These sites would have undergone assessment by the appropriate regulator and their WAC would therefore reflect the necessary limitations and conditions imposed on them by the regulator through their environmental permit.

3.4.2 Wastes Transferred Off-Site

Waste transferred off-site would only be disposed of to sites that are suitably authorised to receive such wastes. EDF Energy has established contractual and procedural arrangements with a number of waste providers which ensure that waste is sent in compliance with the receiving sites WAC.

3.4.3 Wastes Received On-Site

Any radioactive waste received at Hunterston B Power Station for the purposes of onward disposal would be managed in the accordance with the site's radioactive waste safety case and radioactive waste governance arrangements and therefore the risk to the environment will be reduced to an acceptable level.

4 Waste Information

This section provides a description on the wastes generated at Hunterston B Power Station, in terms of characteristics and amount of activity. In each case the description is separated into:

- Wastes which are currently disposable within reasonable timescales under the existing authorisation but which could be managed more effectively if the proposed changes are made; and
- Wastes which are not currently disposable within reasonable timescales under the existing authorisation.

This information is included as it is a requirement of SEPA's RSA authorisation variation application form.

4.1 Characterisation of the Affected Wastes

4.1.1 Disposable Waste Streams

The following waste streams can be disposed within reasonable timescales under the existing authorisation but could be managed more effectively if the proposed changes were made:

- Generic solid LLW
- LLW oils and solvents

Data sheets (ref 5) for each of these waste streams are presented below that describe these waste streams in more detail, identifying the source of the waste, the existing storage arrangements and justification for the preferred management approach.

Table 3: Generic Solid LLW

Description of Waste Stream and its Characteristics
Solid LLW consists of general waste materials, secondary wastes and redundant items with a radioactive content not exceeding 4 GBq/te of alpha or 12 GBq/te of beta/gamma activity. Miscellaneous and trash LLW consists of a wide range of contaminated material, including paper and plastic, swabs and wipes used for decontamination and metallic items. It is collected in bins, or other suitable receptacles for larger items, throughout the radiation controlled area (RCA). The wastes will be produced during all phases of operations and decommissioning where activities are carried out within controlled areas. LLW is generally sub-divided into 5 categories all of which exhibit different properties allowing a variety of processing options to be pursued. The 5 categories are as follows: <u>Incinerable LLW</u> Incinerable solid LLW includes some of the general low level wastes produced from routine operations that are suitable for incineration such as paper, wood and some plastics. The radionuclide contents of these wastes must be such that they would not cause a breach of the authorisation for on-site incineration or the WAC for off-site incineration. The other three categories are all wastes that cannot be incinerated because they are not combustible in the temperature range of available incinerators, they exceed authorised radioactivity limits or their chemical constituents do not comply with authorised allowances. <u>Recyclable Metallic LLW</u> Certain metallic wastes that can be either compactable or non-compactable are suitable for treatment

by shot blasting or melting (currently only available overseas) to decontaminate the majority of the metal to levels suitable for recycling, leaving only a small residual volume of LLW requiring disposal. Treatment in this manner is preferable to treatment as compactable or non-compactable because of greater reductions in waste volumes for disposal. Some metals are not suitable for this treatment however because they do not meet the required WAC, for example because they are painted or have inaccessible voids that cannot be decontaminated. It should be noted that this disposal route has only recently become available and as such not all stations are set up to utilise it, although all have authorisations to do so. Compactable LLW Essentially any low level wastes that can be compacted to reduce their volume for disposal are suitable for supercompaction even reassertible materials such as rubber, although care must be taken to ensure that they are mixed appropriately with materials that will not reassert. Non-compactable LLW All LLW that is not suitable for incineration, metal recycling or supercompaction is considered to be non-compactable LLW.
Origin of the Waste Stream
LLW may potentially arise from any activities within the controlled areas. It is produced mainly as a result of refuelling, irradiated fuel storage, active maintenance activities and vessel entry activities. Most LLW is accumulated and processed on site over a short timescale. It is then dispatched for off-site treatment and disposal as soon as a sufficient volume has been accumulated to make a consignment economically viable.

Table 4: Generic LLW Oils and Solvents

Description of Waste Stream and its Characteristics
Active waste oil arisings are assayed and may contain the full spectrum of activity found in liquid waste treated in the liquid waste processing facilities. The activity in the oil is caused by activity uptake from the reactor coolant. Waste organic solvents are also stored and assayed in a similar fashion. There are also oil arisings that occur within the tritiated water storage tanks that serve the desiccant driers. This waste has been removed at a number of stations and placed into a variety of containers. These are covered separately in the ILW Oils table.
Origin of the Waste Stream
Active waste oils are generated in a number of areas where they are utilised by various plant items as lubricants. Primary sources are the operation and maintenance of the gas circulators and from the oil separators used in liquid waste processing. There are also miscellaneous arisings of oil from controlled areas. Organic solvents are generated routinely through used liquid scintillant and other approved organic solvents that may be used on site.

4.1.2 Waste Streams that Cannot be Disposed Of at all or Within Reasonable Timescales

The following waste streams cannot currently be disposed of at all or within reasonable timescales under the existing authorisation:

- ILW oils
- ILW Catalyst and Desiccant

- ILW Ion Exchange Resin and Sand
- ILW Sludge

Data sheets (ref 5) for each of these waste streams are presented below that describe these waste streams in more detail, identifying the source of the waste, the existing storage arrangements and justification for the preferred management approach.

Table 6: ILW Oils

Description of Waste Stream and its Characteristics
Active waste oil arisings are assayed and may contain the full spectrum of activity found in liquid waste treated in the liquid waste processing facilities. The activity in the oil is caused by activity uptake from the reactor coolant. There are also oil arisings that occur within the tritiated water storage tanks that serve the desiccant driers. This waste has been removed at a number of stations and placed into a variety of containers.
Origin of the Waste Stream
Active waste oils are generated in a number of areas where they are utilised by various plant items as lubricants. Primary sources are the operation and maintenance of the gas circulators and from the oil separators used in liquid waste processing. There are also miscellaneous arisings of oil from controlled areas.

Table 9: ILW Catalyst and Desiccant

Description of Waste Stream and its Characteristics
Catalyst Radionuclide concentrations associated with these wastes are expected to be low except for tritium and S-35. The level of tritium in the waste will determine whether it is treated as ILW or LLW. Desiccant Radionuclide concentrations are expected to be low, except tritium and S-35. However, radioactive decay of S-35 (half life 87 days) means that the specific activity is low in wastes which have been stored for more than 3 years. The level of tritium chemically bonded in the waste determines whether it is to be treated as ILW or LLW.
Origin of the Waste Stream
Catalyst The AGR reactor gas bypass plant contains recombination units for recombining oxygen with any CO which has formed within the CO_2 reactor coolant gas. The unit also converts gaseous species of hydrogen to water, thereby removing tritiated water vapour moisture from the coolant. The catalyst is in the form of granular alumina / platinum catalyst, the platinum having been deposited onto an alumina base granule (0.3% by weight). Once the material ceases to fulfil its function and there is a risk of oxygen breaking through to the reactor, the catalyst is replaced and the spent catalyst becomes a waste product. Desiccant In order to remove water vapour from the AGR gas coolant the gas by-pass stream is passed through towers containing beads of silica gel based desiccant. A component of the water vapour that is absorbed into the desiccant is tritiated. The tritium originates mainly as a ternary fission product, with a possible additional contribution from the activation of lithium impurities. Desiccant may contain both ceramic and steel balls which are used to retain the desiccant within the towers. These balls will need

to be removed before processing of desiccant. The effectiveness of the desiccant decreases over time as a result of the temperature cycling resulting from regeneration cycles; it is therefore replaced periodically during statutory outages. The determination of desiccant life, and decision as to which planned outage the in-service batch will last until, is made by assessing the frequency of desiccant regeneration cycles. Batches can be changed after anything between a few years to over 10 years. Before being finally discharged from the reactor driers, desiccant is heated as for regeneration to ensure the activity loading is minimised.

Table 10: ILW Ion Exchange Resin and Sand

Description of Waste Stream and Its Characteristics
<u>IX Resin</u> Normally only organic resins are used, although it is possible that some inorganic resins may arise as waste in the future. The waste arisings fall into the categories of both ILWand LAW. In general, spent PWTP IX resin is expected to be HAW, whereas the relatively small volumes of AETP IX resin are expected to be LAW. The contamination present is mainly in the form of Fe-55, Cr-51, Co-60, S-35, Mn-54 and Ca-45. The IX resins cannot be regenerated and on exhaustion are transferred to storage tanks. These resins collect a variety of dissolved materials from the pond water. The current resin will remove some caesium but its efficiency is limited by the current AGR pond chemistry. The strategy for dealing with caesium contamination of AGR ponds is to periodically introduce an ion-exchange unit, charged with a specific cation resin and running it until exhaustion (estimated 3 to 4 weeks). This generates a slightly different wasteform but one which can be processed in the same manner as other resins. Following the correction of the caesium level, control of pond water radioactivity would revert to the normal mixed-bed ion-exchange resin. Characterisation of the settling tanks will be required before determining which resins can be processed as LLW and which will require treatment as HAW. ILWresins once processed into a disposable wasteform and package will require interim storage on site until the Geological Disposal Facility is available to receive wastes. <u>Sand</u> A significant fraction of the contaminants present in sand are short lived radionuclides e.g. iron-55, chromium-51, cobalt-60, sulphur-35, manganese-54, and calcium-45. Also present may be zinc-65, caesium-137 and caesium-134 particulate. Characterisation of the settling tanks will be required before determining which sands can be processed as LLWand which will require treatment as HAW.
Origin of the Waste Stream
<u>IX Resin</u> IX resins are a solid organic material usually in the form of beads that are used to treat a variety of effluents. These resin beads are usually contained in steel tanks through which the water passes, the resins work by adsorbing soluble ions from the liquids that are passed over them and as a result reduce the soluble activity in the water. Radioactive ion-exchange resins arise mainly from pond water treatment in the PWTPs but ion-exchange resins also arise from liquid effluent treatment in the AETPs. The resins are used for the removal of soluble radioactive species from the liquids processed. Spent resin is discharged from IX plant when exhausted and transferred to storage vessels. <u>Sand</u> The processing of active liquid effluent at AGR power stations produces waste in the form of contaminated filter sand and anthracite. Sand is used as the primary filtration medium in the active effluent treatment plants and also in the pond water treatment plants. Anthracite is used as a filter medium to process soapy effluent. These are a separate design of deep bed sand filters, but the spent filter media may be managed in the same way.

Backflushing of the sand pressure filters produces waste in the form of sand which in some cases mixed with sludges. The sand or anthracite filtration media is only discharged from the filter when it no longer responds to the normal cleaning process, that is, when filter clogging requires a medium change. The sand may have a variety of grades of coarseness. Similarly, at some stations a fine grade of anthracite arises with sludges backwashed off the deep bed filters.

Table 8: AGR ILW Sludge

Description of Waste Stream and its Characteristics
The sludges comprise of solid particulate material and may be oily or non-oily depending on how they have arisen. A significant fraction of the contamination present in sludges are short lived radionuclides e.g. Fe-55, Cr-51, Co-60, S-35, Mn-54 and Ca-45 and as such storage in settling tanks allows for a significant reduction in sludge activity. Also present in sludges may be Zn-65, Cs-137 and Cs-134 particulate. The waste arisings fall into the categories of both ILW and LLW. In general the more active sludges arise in the PWTP and lower activity sludges arise in the AETP due to the nature of the effluent that the two plants treat. Characterisation of the settling tanks will be required before determining which sludges can be processed as LLW and which will require treatment as ILW.
Origin of the Waste Stream
The processing of active effluent at AGR stations produces waste in the form of sludges. Predominantly sludges arise from the backwashing of sand filters in the AETP and PWTP but other processes cause sludge arisings such as the oil bound sludges generated from gas circulator maintenance and the AETP oil separators.

4.2 Waste Transfers Off-Site in a Typical Year

4.2.1 Disposable Waste Streams

The tables below provide an overview of radioactive waste transferred off-site in a typical year. The data is based on consignments made from HNB during the period 2009 – 2012 (Ref 6).

Table 12: Waste transferred to a thermal treatment (incineration) facility

Radioactive Content	Normal Activity Breakdown (MBq y^{-1})
Total Alpha	5.4E-01
Carbon-14	5.7E+00
Iodine-129	0.0E+00
Tritium	5.2E+03
Cobalt-60	0.0E+00
Other Radionuclide (Cobalt 58 excepted)	4.9E+02
Total Annual Activity (GBq y^{-1})	**5.7E+03**
Raw Waste Annual Volume (m^3)	**2.3E+01**

Table 14: Waste to be transferred to the Low Level Waste Repository (LLWR)

Radioactive Content	Normal Activity Breakdown (MBq y-1)
Total Alpha	7.5E+01
Carbon-14	3.0E+02
Iodine-129	0.0E+00
Tritium	2.0E+04
Cobalt-60	1.9E+03
Other Radionuclide (Cobalt 58 excepted)	2.6E+04
Total Annual Activity (GBq y-1)	**4.8E+04**
Raw Waste Annual Volume (m3)	**5.4E+01**

4.2.2 Waste Streams That This Variation Would Allow To Be Transferred Off-Site

Over Hunterston B Power Station's generating lifetime radioactive wastes have arisen which cannot be transferred to authorised sites for treatment and disposal due to constraints the authorisation places on the physical and radioactive characteristics of the waste. Should the proposed changes in this application be granted it would be Hunterston B Power Station's intention to dispose of these wastes as soon as reasonably practicable to comply with Site License Condition 32. Volumes of these waste streams including what has already arisen and what is predicted to arise over the remaining generating life, excluding any life extension that may be granted are given below (Ref 7).

Table 15: Volume and activities of wastes not currently disposable under the permit

Stream	Activity Category	Packaged Volume/ m3
ILW Resin and Sand	**ILW**	**97.4**
ILW Catalyst and Desiccant	**ILW**	**1000**
ILW Sludge	**ILW**	**75.7**
ILW oils	**ILW**	**0.15**[2]

5 Definitions

[2] Volumes of ILW oils are not declared in the 2010 UK radioactive waste inventory therefore Hunterston B Power Station's local radioactive waste inventory has been used.

Word or phrase	Definition
AETP	Active Effluent Treatment Plant
AGR	Advanced Gas Reactor Power Station
BPEO	Best Practicable Environmental Option
BPM	Best Practical Means (applicable in Scotland – formerly BPEO and BPM)
Characterisation	The process by which the waste characteristics are determined and includes: • invasive techniques to the waste or waste package for example undertaking laboratory analysis on a sample of the waste. • non invasive to the waste or waste package for example using known data and models to predict the waste characteristics based on decay rates.
FPCCS	Fuel Pond Cooling and Cleaning System
ILW	Intermediate Level Waste ILW is waste with an activity over 12GBq/te beta and/or gamma and/or over 4GBq/te alpha with no significant decay heat generation that would require cooling
IX	Ion Exchange
LLW	Low Level Waste LLW is waste with an activity below 12GBq/te beta and/or gamma and/or below 4GBq/te alpha. This excludes waste that is disposed of as exempt.
MAETP	Mobile Active Effluent Treatment Plant
ONR	Office for Nuclear Regulation
PWTP	Pond Water Treatment Plant
Regulators	Health and Safety Executive, Environment Agency, Scottish Environment Protection Agency
RSA93	Radioactive Substances Act 1993 (Scotland)
Segregation	Separation of waste into as many separate wastestreams as practicable to aid management of the waste and to minimise volume of ILW this may be based on physical, biological, chemical or radiological properties.
SEPA	Scottish Environment Protection Agency
WAC	Waste Acceptance Criteria
Wastestream	A collection of waste / waste items with similar radiochemical physical and chemical properties such that they may be managed under a common waste management strategy.

6 References

1 RSA/A/0070116/VN02 — Hunterston B Power Station certificate of authorisation

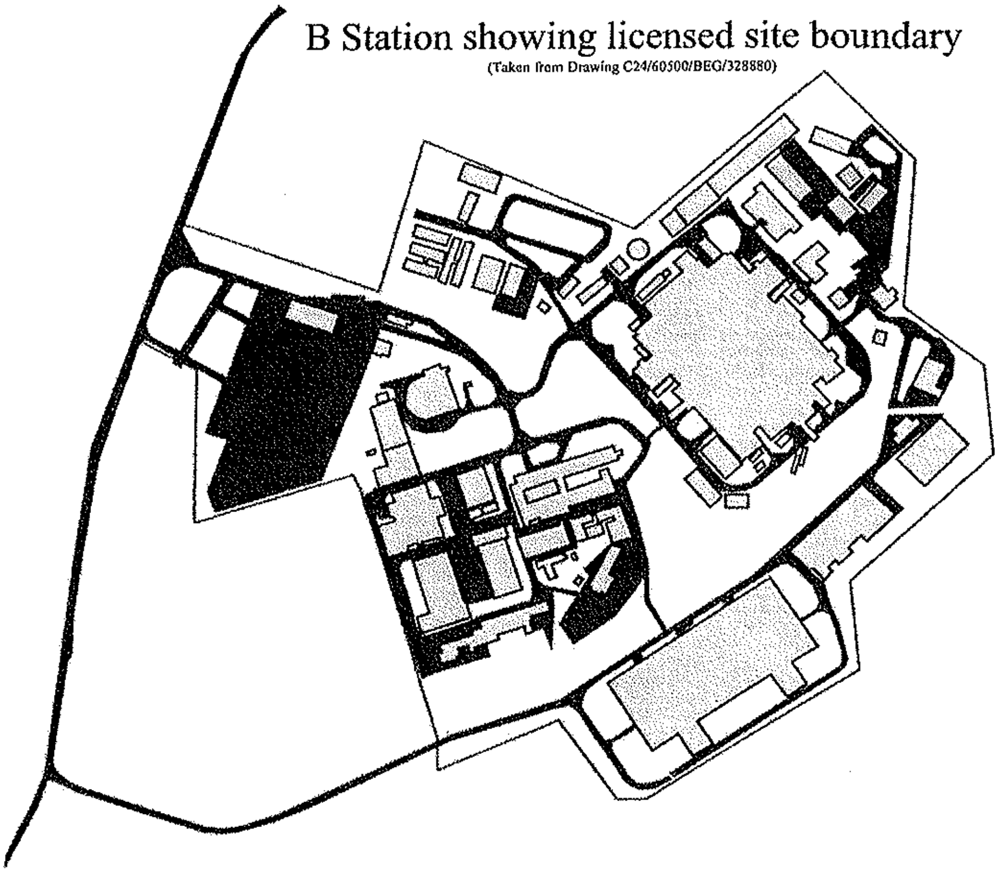
2 SEPA website — SEPA Policy on the Regulation of Disposal of Radioactive Low Level Waste from Nuclear Sites

3 NDA website — UK Strategy for the Management of

		Solid Low Level Radioactive Waste from the Nuclear Industry
4	BEG/SPEC/SHE/ENVI/038	Definition, Review and Optimisation of BEG Radioactive Waste Management Strategies
5	ERO/REP/0029/GEN	Sustainable Approach to Waste Management: Fleet Technical Baseline and underpinning Research & Development (FTBuRD) Document
6	HUN/TSSD/508 and HUN/TSSD/777	Monthly Low Level Waste Consignment Reports
7	NDA Website	The 2010 UK Radioactive Waste Inventory

Appendix A

A.1 Site Plan of Hunterston B Power Station



A.2 Current Authorisation Limitation

COLUMN 1	COLUMN 2	COLUMN 3		COLUMN 4
Person to whom waste may be disposed	**Waste type**	**Annual Activity Limits**		**Annual Volume Limit (Cubic metres)**
		Radionuclide	**Limit (GBq)**	
Sellafield Site Operator	Low Level Waste	Uranium	1.0	500
		Radium-226 plus Thorium-232	0.2	
		Other alpha emitters	2.3	
		Carbon-14	5	
		Iodine-129	0.1	
		Tritium	1000	
		Cobalt-60	20	
		Other radionuclides[2]	100	
Winfrith Site Operator		Uranium	1.0	500
		Radium-226 plus Thorium-232	0.2	
		Other alpha emitters	2.3	
		Carbon-14	5	
		Iodine-129	0.1	
		Tritium	1000	
		Cobalt-60	20	
		Other radionuclides[2]	100	
Low Level Waste Repository Site Operator	Low Level Waste	Uranium	1.0	500
		Radium-226 plus Thorium-232	0.2	
		Other alpha emitters	2.3	
		Carbon-14	5	
		Iodine-129	0.1	
		Tritium	1000	
		Cobalt-60	20	
		Other radionuclides[2]	100	
Hythe Incinerator Operator	Low Level Waste and Organic Liquid Waste	Tritium	25	Not Limited
		Carbon-14	1	
		Sulphur-35	25	

COLUMN 1	COLUMN 2	COLUMN 3		COLUMN 4
		Any non alpha emitting radionuclides taken together excluding Tritium, Carbon-14 and Sulphur-35	10	
		Alpha emitting radionuclides in total	0.02	

[1] "Other alpha emitters" means alpha-emitting radionuclides with half lives greater than three months excluding uranium, radium-226 and thorium 232.

2. " Other radionuclides" means:

(a) iron-55 and beta emitting radionuclides with half lives greater than three months unless individually specified in this Table and

(b) any other radionuclides specified in writing by SEPA