

Review of Operating Techniques and Permit Conditions – Pembroke Power Station

January 2020

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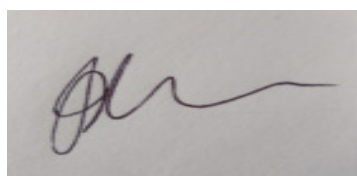
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1. Introduction

RWE Pembroke Power Station (PPS) operates under Environmental Permitting Regulations, EPR/DP3333TA (EP). Under Schedule 1 – Operations, Table S1.2 Operating techniques describes the methods and techniques that are used in order to operate the installation. These techniques were proposed prior to completion of the plant and will require updating from time to time.

Following a routine site visit by Natural Resources Wales (NRW) it was agreed that a review of these techniques be undertaken to ensure they remain current and to update them if required. This report is the output of that review and should be considered as an update to them, replacing previous versions where appropriate.

2. Objectives and Scope

This report has been produced to:

- Review the operating techniques section of the site's EP
- To ensure the site is carrying out their commitments and hence complying with their EP

3. Findings and Actions

3.1. The Commitment to Undertake a Water Efficiency Audit

On reviewing the permit, conflicting statements were found regarding undertaking a water efficiency audit. The conditions set in the EP, section 1.3.1 (c), require a water audit to be undertaken at least every four years. In contrast, volume 1 of the supporting documents, which the table S1.2 Operating techniques refers to in the EP, require an audit to be carried out within 2 years of operation (Appendix A).

The station has been in full operation since September 2012, the first audit was reported in 2014 and the second for 2018, both complying with the conditions set in the EP and the operating techniques. Future audits will be undertaken at least every four years in line with the permit requirement.

3.2. Contaminant Source - Bulk Storage Tank Locations

A thorough investigation took place into all contaminant source bulk storage on site. Since construction new chemical and diesel storage areas have been put in place. This is reflected in the updated versions of tables 3.4 to 3.8b that can be found in Appendix B. New numbers have been assigned to the tables due to new storage areas and new individual numbers have been assigned to the specific descriptions of contaminants stored. To compliment this, Figure 36, Contaminant Source Bulk Storage Locations (Appendix B) has also been updated.

3.3. Foul Sewer Drainage

A foul sewer drainage system was constructed as part of the station construction. This plant was sufficient for the numbers of a normal running site but when the first C inspections occurred in 2015 it was seen that the plant was unable to cope with the increased numbers on site and sewage had to be tankered offsite. C inspections occur every 4 to 5 years with the second round planned for 2019/2020. In order to ensure the sewage system could cope with the increased numbers on site during a C inspection a larger foul sewer drainage system was constructed and completed in January 2019. This has been discussed previously with NRW and should eliminate the need for tankering sewage offsite.

3.4. Haven Monitoring Programme 2015 – 2020

This agreed programme has now come to an end. A new programme has been agreed with NRW until 2026 (with a review scheduled for 2023) and has begun.

4. Conclusion

Since the EP was issued in 2010 two water efficiency audits have been undertaken and to remain compliant with the EP the next one should be done in 2022.

Since construction some new storage areas for hazardous materials have been put in place. These areas have been updated on the relevant map and new tables have been produced. If new hazardous materials or storage areas are constructed they will be added when they occur.

The foul sewer drainage system has been updated to cope with the larger numbers on site during planned outages. Other than for routine cleaning of the primary tank, this has prevented any the need for tankering.

A new programme for the Haven Monitoring has been agreed with NRW and is being implemented.

All other parts of the Table S1.2 Operations Techniques were found to be continue to be relevant.

Appendices

Appendix A. Environmental Permit

The red text in the following table describes any actions taken to continue to comply with the Environmental permit.

Table S1.2 Operating techniques

Description	Parts	Date Received
Application	The following elements of Pembroke EP Application Appropriate Assessment Supporting Document – Chapter 2, Part 1, Volume 2: Paragraphs 2.5.1.4 to 2.5.1.13 inclusive (main plant design) Paragraph 2.5.2.1.2 (installation of DLN burners) Paragraph 2.5.2.2.8 (combustion optimisation) Paragraph 2.5.3.4.1 in so far as it specifies the provision of coarse screens with vertical bar spacing of not greater than 50mm. Paragraphs 2.5.3.4.6 to 2.5.3.4.9 inclusive (drum screens and cooling water pumps) Paragraphs 2.5.3.4.10 and 2.5.3.4.11 (holding tank and fish return) Paragraph 2.5.4.3.4 to 2.5.4.3.6 inclusive (surface water drainage)	25/03/10
Further information on CHP-readiness works set out in the response received 03/09/10 to the Schedule 5 further information request dated 04/08/10.	Section 4.2	03/09/10
Document entitled 'Supporting Document for a New Environmental Permit Application Ref: JP3638LK' in Volume 1 of the Pembroke Environmental Permit Application (revised and re-submitted following submission of original permit application).	Section 2.5 Third paragraph of the section entitled 'Cooling' in section 2.4.1 (i.e. the commitment to undertake a water efficiency audit). The first water efficiency audit was carried out in 2014, this was within 2 years of operations beginning onsite, a second audit was undertaken in 2018.	22/03/11
Updated plan of permanent operational drainage (drawing number Figure 4) Updated in February 2016, now Rev. C.	All	11/05/11

Pembroke Environment Permit Application Appropriate Assessment Supporting Document – Volume 2 Part 2 (revised and re-submitted following submission of original permit application).	The abatement measures set out Table 2.11 ‘BAT assessment for principal noise sources N1-N6’ in Chapter 2 (noise) Paragraph 2.3.4.1 of Chapter 2 (noise)	16/06/11
Further information entitled ‘Pembroke Power Station Sodium Hypochlorite Dosing v2 June 2011’	▪ All	16/06/11
Further information entitled ‘Clarification on Biocide Dosing to Cooling Water Intake Drum Screen Chambers v2 June 2011’	• All	16/06/11
Revised Appendix 2.3 of permit application ‘Cooling water system vulnerability to bio-fouling v3 June 2011’	• Section 7.3.2 (as regards cooling water system design), 7.3.3 (as regards the design of the auxiliary cooling system) and 7.4 (as regards dosing locations and temperature below which dosing will not occur).	16/06/11
Revised Chapter 3 of Part 2 of Volume 2 of the Application	The following elements of Pembroke EP Application Appropriate Assessment Supporting Document – Volume 2 Part 2: The bunding arrangements set out in the following tables in Chapter 3 (Site conditions and contamination hazards): ○ Table 3.4 ‘Details of oil and chemical storage, site general’ ○ Table 3.5 ‘Details of chemical storage at Water Treatment Plant’ ○ Table 3.6 ‘Details of oil and chemicals stored in main turbine halls’ ○ Table 3.7a ‘Transformers and oil-filled switches’ ○ Table 3.8b ‘Chemical clean chemicals (commissioning only)’ All tables have been updated. Figure 36 has also been updated, FIG 36 V2 CONTAMINANT SOURCE BULK STORAGE LOCATIONS Paragraphs 3.5.3.1 and 3.5.3.2 (Hardstandings and bunds) Paragraphs 3.5.6.4, 3.5.6.5 and 3.5.6.6 (Surface water drainage)	07/07/1 31/05/19

	Paragraph 3.5.7.1 (process effluent drainage)	
Response to Point 2 of further information request dated 12/09/11	Dose rate declared for SERVO Antiscale AW	23/09/11
Response to Point 3 of further information request dated 12/09/11	Proposed use of sodium hydroxide as a boiler dosing chemical and proposed use of a polyacrylate material as a water treatment plant antiscalant	23/09/11
Variation application	Section 2: Foul sewer drainage on the Pembroke power station site This was upgraded and complete by January 2019	07/01/13
Response to regulation 60(1) Notice – request for information dated 14/11/14	Compliance route and operating techniques identified in response to questions 2 (LCP compliance route), 4 (LCP configuration), 5 (LCP net rated thermal input), 6 (MSUL/MSDL), 9 (ELVs) and 11 (Monitoring requirements).	30/03/15
Haven Monitoring Programme 2015 – 2020	All – programme for monitoring in the Pembrokeshire Marine SAC A new programme agreed and started 2020	June 2015 coming to end
Receipt of additional information to the regulation 60(1) Notice – requested by letter dated 08/06/15	Additional information received in response to questions 5 (LCP net rated thermal input), 6 (MSUL/MSDL) and 9 (ELVs).	30/07/15

Appendix B.

Volume 2/Part II/Chapter 3 – Site Conditions and Contamination Hazards

Table 3.4 Details of chemical storage at Chemical Stores

Tank No.	Description	Material stored	Volume of tank	Volume usually stored	Bunding arrangements
1	Gas turbine compressor cleaner	Proprietary reagent	3 x 1m ³ IBCs	3m ³	Stored in Denios container
2	Bisulphite Solution	Typically 10% stock solution of proprietary reagent (acidic)	2 x 1m ³ IBCs	Up to 2m ³	Stored in Denios container
3	Sodium hydroxide	NaOH (46% w/w)	2 x 1m ³ IBCs	Up to 2m ³	Stored in Denios container
4	Ammonia	NH ₃	2 x 1m ³ IBCs	Up to 2m ³	Stored in Denios container
5	Antiscalent (Proprietary manufacturers standard)	Proprietary reagent	3 x 0.2m ³ barrels	Up to 0.6m ³	Stored in Denios container
6	Acetone	C ₃ H ₆ O	Varied,	Up to 0.2m ³	Stored in Denios container
7	Reverse Osmosis Cleaning agent	Typically 5% stock solutions of proprietary reagents (acidic and alkaline components)	0.2m ³ barrel	Up to 0.2m ³	Stored in Denios container
8	Accepta		1m ³ IBC	Up to 1m ³	Stored in Denios container
9	Polyaluminium chloride	Solution containing 5.35% Al and 10.2 %Cl	1m ³ IBC	Up to 1m ³	Stored in Denios container
10	Sodium hypochlorite	NaOCl (up to 15% w/w available Cl)	1m ³ IBC	Up to 1m ³	Stored in Denios container

Table 3.5 Details of chemical storage at Water Treatment Plant and WTP Electrical Module

Tank No.	Description	Material stored	Volume of tank	Volume usually stored	Bunding arrangements	Pipework arrangement
11	Sulphuric Acid	H ₂ SO ₄ (96% w/w)	1x 5m ³ tank (permanent) and 1m ³ IBC (temporary)	Up to 5m ³	Bunded capable of holding at least 110% of the volume of the tank.	HDPE double walled from dosing pump discharge

12	Sodium hydroxide	NaOH (46% w/w)	1x 5m ³ tank (permanent) and 1m ³ IBC (temporary)	Up to 5m ³	Bunded capable of holding at least 110% of the volume of the tank.	HDPE double walled from dosing pump discharge
13	Polyaluminium chloride	Solution containing 5.35% Al and 10.2 %Cl	1m ³ IBC	Up to 1m ³	Bunded capable of holding at least 110% of the volume of the tank.	HDPE double walled from dosing pump discharge
14	Reverse Osmosis Cleaning agent	Typically 5% stock solutions of proprietary reagents (acidic and alkaline components)		Brought on site when required for infrequent cleans	Dilution tank would be bunded (kerbed area). Containers should be stored in contained area.	To be filled into cleaning tank by drum pump
15	Bisulphite Solution	Typically 10% stock solution of proprietary reagent (acidic)	2 x 1m ³ IBCs	Up to 2m ³	Stored in kerbed area capable of holding at least 110% of the volume of an IBC	HDPE double walled from dosing pump discharge
16	Antiscalent (Proprietary manufacturers standard)	Proprietary reagent	2 x 0.2m ³ barrels	Up to 0.4m ³	Stored in kerbed area capable of holding at least 110% of the volume of a barrel	HDPE double walled from dosing pump discharge
17	Sodium hypochlorite	NaOCl (up to 15% w/w available Cl)	3 x 1m ³ IBCs	Up to 2m ³	Stored in kerbed area capable of holding at least 110% of the volume of an IBC	HDPE double walled from dosing pump discharge
18	Innergen	Ar 50%, N 42%, CO ₂ 8%	1m ³	Up to 1m ³	N/A	Pipework dry so N/A

Table 3.6 Details of oil and chemicals stored in main turbine halls

Tank No.	Description	Material stored	Volume of tank	Volume usually stored	Bunding arrangements	Pipework arrangement
19	Ammonia	3-5% w/w	2x1m ³ IBC per unit	Up to 10m ³	Stored in kerbed area capable of holding at least 110% of the volume of an IBC	HDPE
20	Sodium Hydroxide	3-5% w/w	2x1m ³ IBC per unit	Up to 10m ³	Stored in kerbed area capable of holding at least 110% of the volume of an IBC	HDPE
21	Lube oil, power oil, jacking oil, steel tank integrated into pump skid	Oil	5x32m ³	160m ³	Concrete bunding, sized to contain 110% of contents of each tank	Steel
22	Innergen	50% Ar, 42% N, 8% CO ₂	1.1m ³	5.5 m ³	Stored in kerbed area capable of holding at least 110% of the volume of an IBC	Pipework dry so N/A

23	Propane	C ₃ H ₈	20kg	10kg	N/A	Pipework dry so N/A
24	Hydrogen	H	389m ³	1945m ³	N/A	Pipework dry so N/A
25	Perfecto, Hyspin, Alpha	Oil	6 x 0.2m ³	1.2m ³	Only stored in Unit 31, over drip tray which is at least 25% of the aggregate storage in accordance with the requirements of Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016	N/A

Table 3.7 Details of oil and chemical storage, Site general

Tank no.	Area Found	Description	Material stored	Volume of tank	Volume usually stored	Bunding arrangements	Pipework arrangement
26	Emergency generators south of each turbine building	Distillate fuel oil for standby diesel generators	BS2869 Class D fuel spec	5 tanks, each approx 1.5m ³	Up to 7500m ³	Either bunded or double walled tank in accordance with the requirements of Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016	HDPE
27	Generator Transformers	Mineral oil	Perfecto	5 x 120m ³	600m ³	Concrete bunding, sized to contain 110% of contents of each tank	Steel
28	Station service transformers	Mineral oil	Nynas Nitro Gemini X	5 x 22m ³	110m ³	Concrete bunding to 30 minutes of fire water	Pipework dry so N/A
29	Southwest of WTP	Distillate fuel oil for fire water pumps.	BS2869 Class D fuel spec	1500 litres	Up to 1500 litres	Either bunded or double walled tank in accordance with the requirements of Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016	HDPE
30	Bulk gas storage area	N/A	CO ₂	5 x 3.4m ³	17m ³	N/A	Pipework dry so N/A

31	Bulk gas storage area	N/A	H	5 x 389m ³	1945m ³	N/A	Pipework dry so N/A
32	Refuelling area	N/A	Diesel	18m ³	Up to 18m ³	Double walled tank	N/A
33	Refuelling area	N/A	Diesel	2.2m ³	Up to 2.2m ³	Double walled tank	N/A
34	Refuelling area	N/A	Diesel	1.4m ³	Up to 1.4m ³	Double walled bowser	N/A
35	Between the turbine building and the HRSG	N/A	CO ₂	5 x 3.4m ³	17m ³	N/A	Pipework dry so N/A
36	Enigma scaffold yard	N/A	Diesel	1m ³	Up to 1m ³	Double walled bowser	N/A
37	MCW intake	Sodium Hypochlorite. Tank. Tank of GRP construction with PVC liner	NaOCl (up to 15% w/w available Cl)	2x100m ³ tanks. One tank is	Up to 70m ³	Bunded capable of holding at least 110% of the volume of the tank.	HDPE
38	MCW intake electrical building	Innergen	Ar 50%, N 42%, CO ₂ 8%	1m ³	1m ³	N/A	Pipework dry so N/A

Table 3.8 Waste oil and gas turbine wash

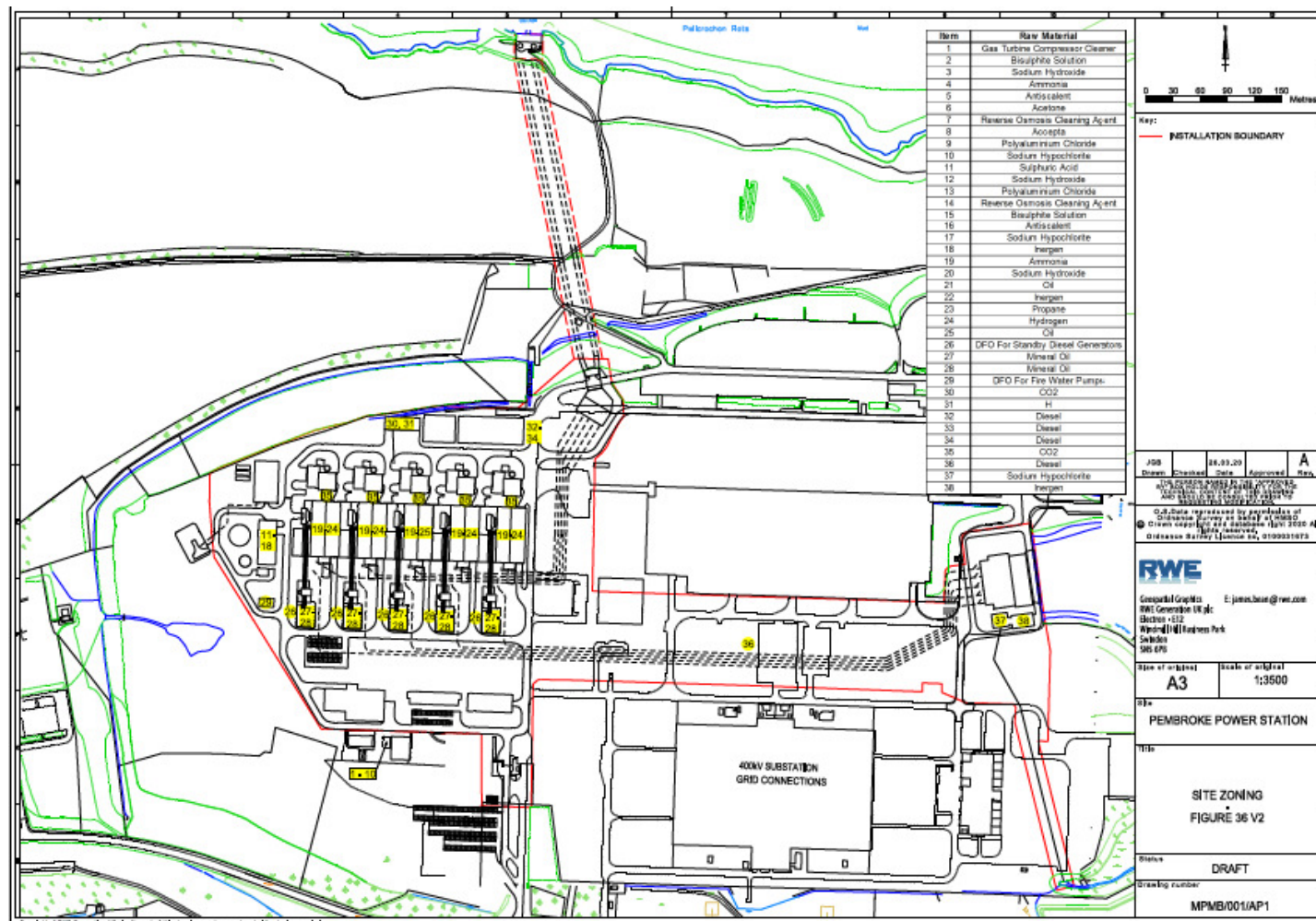
Substance	Volume stored	Where stored	Bunding arrangements	Delivery arrangements
Waste Oil	Varied	Around site then transported to Haz Waste Area	In IBC's on bunds capable of holding at least 110% of the volume of the tank or in Denios containers which are capable of holding at least 25% of the aggregate storage in accordance with the requirements of Water Resources (Control of Pollution) (Oil Storage) (Wales) Regulations 2016	Produced on site. Collected by registered carriers in accordance with the sites waste management procedure GMD/ENV/007 V1

Gas turbine blade wash	Up to 1000l	Gas turbine building. One tank per unit	Blind sump	Collection by licensed carrier offsite
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Table 3.9 Transformers and oil filled switches

Substance	Volume stored	Where stored	Bunding arrangements	Delivery arrangements
Oil	Up to 1000l	Purpose designed area within stores building	Bunded	Drums

Appendix C. Contaminant Source - Bulk Storage Tank Locations



RWE Generation UK plc

RWE Generation UK plc

Windmill Hill Business Park

Whitehill Way

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