

This form will report compliance with your permit as determined by an NRW officer

Site	Pembroke Power Station	Permit Ref	DP3333TA
Operator/Permit holder	RWE Generation UK plc		
Regime	Installation		
Date of assessment	17 September 2019		
Assessment type	Audit		
Parts of the permit assessed	See Below		
Lead officer's name	Karen Dunn		
Recipient's name/position	Ben Williams (see below)	Date issued	11 October 2019

Section 1 – Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations. A detailed explanation is captured in "Compliance Assessment Report Detail" (Section 2) and any actions you may need to take are given in the "Action(s)" (Section 4). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our Compliance Classification Scheme (CCS). CCS Scores can be consolidated or suspended where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your local office.

Permit conditions and compliance summary	CCS Category	Condition(s) breached
A1 - Specified by permit	A	
B1 - Infrastructure - Engineering for prevention and control of emissions	N	
B2 - Infrastructure - Closure and decommissioning	N	
B3 - Infrastructure - Site drainage engineering (clean and foul)	N	
B4 - Infrastructure - Containment of stored materials	A	
B5 - Infrastructure – Plant and equipment	N	
C1 - General Management - Staff competency/training	A	
C2 - General Management - Management system and operating procedures	A	
C3 - General Management - Materials acceptance	N	
C4 - General Management - Storage, handling labelling, labelling and Segregation	N	
D1 - Incident Management - Site security	N	
D2 - Incident Management - accidents, emergency and incident planning	N	
E1 - Emissions - Air	N	
E2 - Emissions - Land and groundwater	A	
E3 - Emissions - Surface water	N	
E4 - Emissions - Sewer	N	
E5 - Emissions - Waste	A	
F1 - Amenity - Odour	N	
F2 - Amenity - Noise	N	
F3 - Amenity - Dust/ fibres/ particulates/ litter	N	
F4 - Amenity - Pests/birds/scavengers	N	
F5 - Amenity - Deposits on road	N	
G1 - Monitoring and Records, Maintenance and Reporting - Monitoring of emissions and environment	A	
G2 - Monitoring and Records, Maintenance and Reporting - Records of activity, site diary/journal/events	N	
G3 - Monitoring and Records, Maintenance and Reporting - Maintenance records	N	
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	N	
H1 - Resource Efficiency - Efficient use of raw materials	N	
H2 - Resource Efficiency - Energy efficiency	A	

KEY: See Section 4 for breach categories, suspended scores will be indicated as such. **A** = Assessed or assessed in part (no evidence of non-compliance), **N** = Not Assessed, **X**= Action only

Number of breaches recorded	0	Total compliance score (see section 5 for scoring scheme)	0
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Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- The part(s) of the permit that were assessed (e.g. maintenance, training, combustion plant, etc.)
- Where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- Any non-compliances identified
- Any non-compliances with directly applicable legislation
- Details of any multiple non-compliances
- Information on the compliance score accrued including:
 - details of advice given;
 - any other areas of concern;
 - any actions requested;
 - any examples of good practice;
 - a reference to photos taken.

This was a pre-arranged routine audit operator representative present were:

Ben Williams – Lead Environmental Engineer/ Acting Regulation and Business Performance Section Head

Dafydd Williams – Environmental Engineer

The following agenda was sent in advance:

Overview – to include update on changes at Pembroke and within NRW Industry Regulation team.

Objectives 2019

Actions and Recommendations from last Audit 20/2/2019

MCW pump – flowmeter Action plan / timeline

Progress on foam reduction and FRR efficiency work

Any updates re: Reg 61 (wording of haven monitoring), EBG, outages

AOB

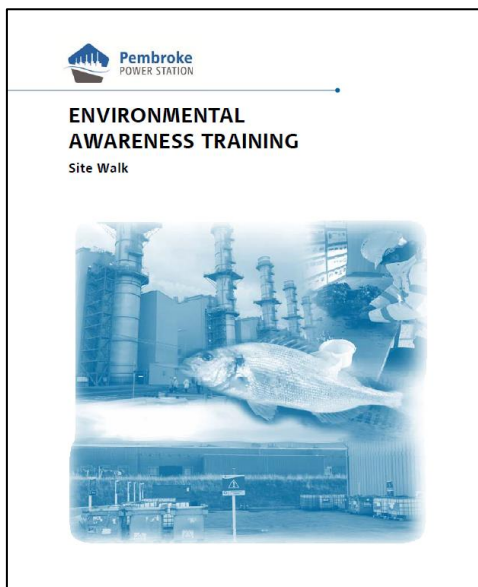
Overview – To include update on changes at Pembroke and within NRW SW Industry Regulation team.

The main objective of this routine audit was to gain an update from the operator on several areas of work since the last visit in February 2019. This year is very busy for the operator with planned major outages or 'C' inspections which were underway at the time of the visit. The audit began with an update on business with some strategic changes proposed as the business continues to move away from coal fired power plant. In August it was announced that RWE Generation UK plc will be closing their last coal fired power station, Aberthaw B near Cardiff, in March 2020 which was brought forward from 2021. This saw a change in Station Manager to Richard Little from Andrew Morgan who is now Head of Technical Services (Engineering) in Swindon. Will Jeffrey who was Production Manager and acting Station Manager at Pembroke, while Andrew Morgan was on secondment, is now Station Manager at Aberthaw from Richard Little. Roland Long is now the Production Manager at the station and Ben Williams is acting Head of Regulation and Business Performance Section Head. There have also been staff changes in NRW following a re-organisation which took effect on 1 July 2019. The NRW Industry Regulation Team in SW Wales has seen staff move into other teams in policy and a new approaches team so a site re-allocation has taken place however there is no change to the current site inspector for the station.

Objectives 2019

During the last audit in February 2019 the operator was finalising the environmental objectives as the management review was underway. It was considered therefore a discussion on the 2019 objectives would be held at a later audit. A copy of the full environmental objectives and targets 2019 linked to the Environment Management System (EMS) for the station was requested and provided by the operator in respect of permit condition 1.1. During this visit and due to additional operatives present at the station for the major 'C' inspections the following objective was examined further with the operator:

PEMBROKE POWER STATION ENVIRONMENTAL OBJECTIVES AND TARGETS 2019										
Aspect	Objective	Target	Programme	Indicators	Responsible Person(s)	Environmental Contact	Comments	Details	PRIM Ref & link	
All	Ensure all staff (RWE and term contractors) are aware of the sites and their environmental responsibilities	Undertake refresher/ initial training with all staff	Complete the new training package. Set up a training session with all teams and contractors. Deliver training as required.	New training package complete. Training plan developed to deliver training to all teams. Begin rolling out training.	Dafydd Williams/ Ben Williams	Dafydd Williams		0 Click here		



An environmental awareness booklet has been produced to ensure that everyone, RWE and term contractors, is aware of their environmental responsibilities at the Pembroke Power Station. The booklet forms part of initial training, from the Station Manager down and is also included in the induction week for new or seconded employees to the station. The plan is to roll out the new training package to all teams at Pembroke as a means of a refresher however, this has been tailored back in 2019 while the major outages are taking place to new or seconded employees only with refreshers recommencing in 2020.

Questions are raised in the environmental awareness training booklet (opposite) which also incorporates a site walk to ensure that staff are familiar with key emission limit values and terminology such as continuous emissions monitoring (CEMS) and Monitoring Certification Scheme (MCERTS) for better understanding.

This was the only objective reviewed during this visit and was found to be actioned and in progress. The major outage in 2019 has impacted on the programme however this only related to refresher training. All new and seconded RWE and term contractors are receiving an environmental awareness at the power station which is beneficial to meet the responsibilities in the environmental permit and abstraction licence held by the operator.

Recommendation: Operator to consider including a version reference to the training booklet in case of update.

Actions and Recommendations from last Audit 20/2/2019

Actions and recommendations from the last audit in February 2019 were reviewed with the operator (for ease of reference they have been replicated below and placed within a boarder to distinguish from any new ones):

Recommendation: Ammonia on the effluent treatment plant to be included in the data for trends for comparison and identification of actions. **COMPLETE**

Action: Operator to update NRW at the next routine audit concerning the damper / silencer once the investigation is complete and conclusions can be drawn concerning the silencer (stack of unit 11). **COMPLETE**

The health and safety database (MADISON) was reviewed with the operator concerning this event. A full investigation has taken place since the last visit when the stack was cordoned off due to debris on the access road. A 'DMAGIC' investigation had been applied (6 staged internal investigation approach to assess the root cause). In brief, the drive shaft had moved away from the actuator due to deformation of the damper. This allowed hot exhaust gas onto the silencer resulting in surface damage and debris from the stack. The damper which was in constant operation had also become wedged open. The recent outage on Unit 11 allowed time for the surface damage to the silence material to be addressed to prevent any further debris. An operational decision to keep the dampers open on the units has been made as it is a specific design feature that is not essential and could pose a danger to plant integrity. It is considered that the 'flashing off' of the feed water tank (FWT) may have resulted in the damper issue as there is no diffuser in place below the waterline. A longer-term action has been placed on the internal database PRIM concerning the FWT being the likely root cause. There was no environmental impact as a result of the surface damage to the silencer material within the stack.

Action: Operator to demonstrate the review of the water efficiency audit at the next NRW routine visit or to provide as soon as practicable. **COMPLETE**

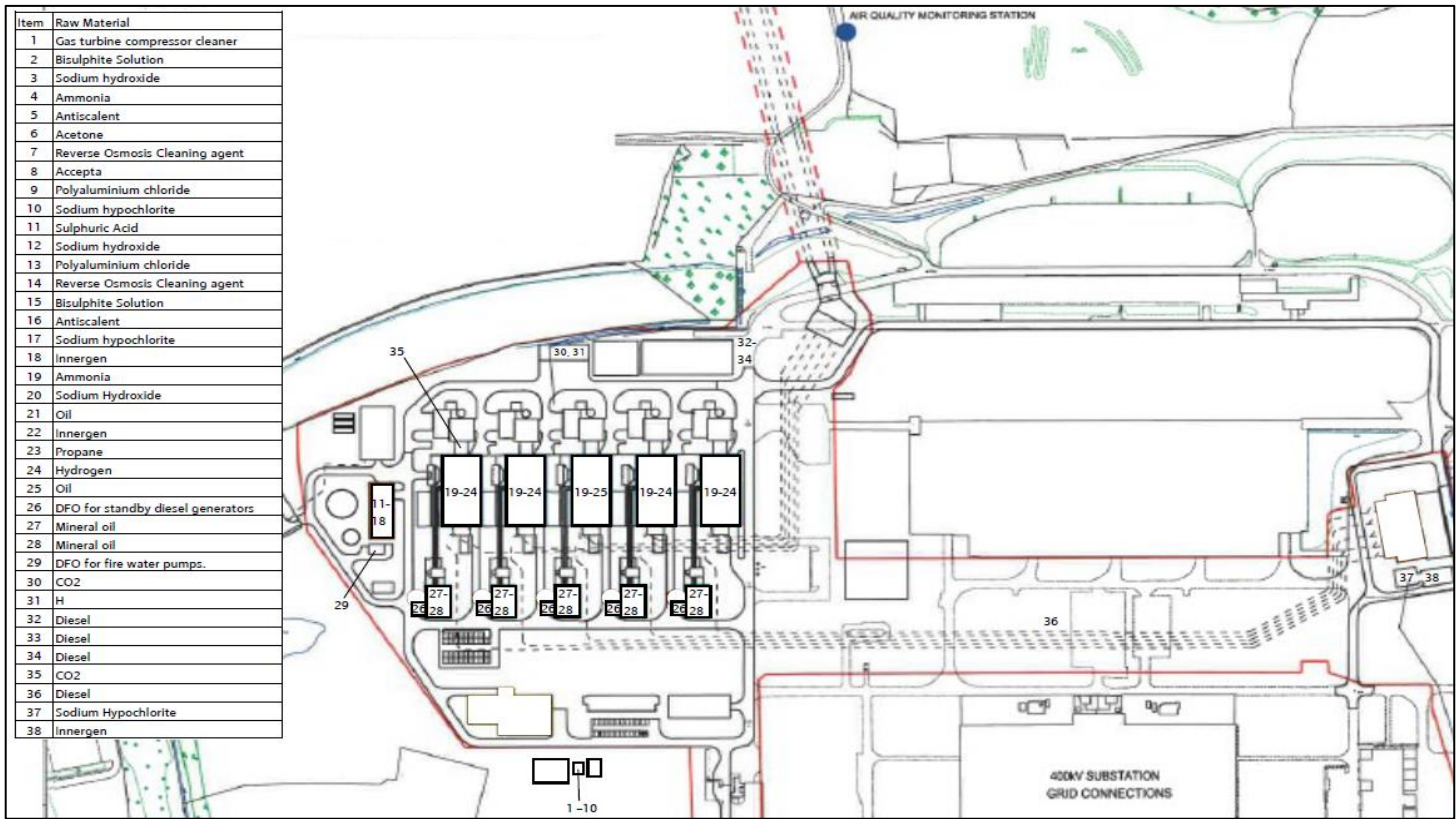
The operator provided a copy of the reviewed water efficiency audit (April 2019) in line with the permit condition 1.3.1 (review frequency of every four years) and a commitment linked to the agreed operating techniques (condition 2.3.1). It is acknowledged that the scope for a cost-effective sustainable opportunity for further water efficiencies is limited as the power station was designed with this purpose. However, in the last internal water audit, efficiency savings were identified concerning 'blowdown' on the heat recovery steam generator (HRSG) and valve type to prevent steam loss (NRW_CAR 5638 25 June 2014). Since then savings have been made concerning the HRSG and all modifications identified and made in 2017 reducing the 'blowdown' discharge significantly. The full reviewed water efficiency audit report submitted in line with the permit has been saved on the NRW site file.

Recommendation: Operator to review the operating techniques (condition 2.3.1 table S1.2) linked to the supporting documentation for inclusion where necessary in the 'Register of Obligations' **COMPLETE**

Recommendation: Operator to review the agreed operating techniques in the permit and consider any changes required in preparation for any forthcoming permit variation application. **COMPLETE**

On review of the operating techniques a very useful overview / annotated map was produced showing the locations of stored raw materials at the station. From a previous NRW audit (please refer to CAR_6001) operational locations of materials e.g. in the turbine

halls differed marginally from the original supporting document linked to the permit. The operating techniques have subsequently been reviewed and updated and are linked to the environment management system and will include the annotated map.



Action: Operator to keep NRW updated on progress concerning the action plan in place to address containment at the power station.

During the last NRW routine audit (CAR_NRW00034703) it was identified that the various tanks at the station had not been subject to the 5-year inspections outlined in the RWE technical procedure which resulted in a non-compliance. Following the audit an action plan (BW e-mail dated 4 March 2019) was agreed to address the failure to adhere with the technical procedure for 'Care of Civil Engineering Assets' linked to the local procedure (LP) at the station.

An update given during this audit established that all tanks and associated pipework have been subject to inspection in compliance with RWE procedures. This has resulted in three tanks being taken out of service due to inspection findings. In brief cracking of the PVC lining on the GRP tank in the water treatment plant (WTP), used for sulphuric acid storage, had allowed some acid into the structure causing softening of the tank. This tank is now being replaced with a different type to prevent a re-occurrence. The operator explained that the type of tank is recognised as difficult to maintain for acid storage, so it is being changed. A very useful discussion was held with Chris Harding the station chemist and process engineer for the WTP to better understand the procedures adopted while the sulphuric acid tank is out of service to safeguard health, safety and the environment.

The pipework on the sodium hypochlorite tank located at the main cooling water (MCW) intake was identified as UV damaged which can render it brittle. The pipework is being replaced and the tanks are currently out of service while there is a suspension on deliveries of sodium hypochlorite.



The photograph opposite was taken of the sodium hypochlorite intake where the pipework was found to be UV damaged.

One out of the two sodium hypochlorite tanks is in general use, allowing the volume stored to be kept below the threshold where the Control of Major Accident Hazards Regulations 2015 would apply. Both tanks were inspected and found to be in good working order.

It was noted that the housekeeping in this raw material store and less frequented area of the station needed some attention as catches on the doors to the instrumentation cabinets were broken.

Recommendation: Sodium Hypochlorite store cabinets and general housekeeping for this area to be considered by the operator.

On internal inspection of the raw water tank at the WTP it was found that areas of weld splatter, from the fitting of internal pipework such as the level gauge to maintain a constant amount of fire water, had resulted in corrosion. Repairs are planned for the raw water tank and to complete small external elements namely bolting and minor coupling which were identified on inspection. There is also further work planned for the de-mineralisation tank.

Action: It was agreed that the operator would provide an update on e-mail to the actions identified concerning the tank inspections and subsequent findings and timeline for completion.



The photograph left shows the water treatment plant (WTP) at the power station.

Demineralised water tank

Raw water tank

The picture below was taken of the inside of the raw water tank at the water treatment plant during the internal inspection.



Internal pipe work for draw off to the WTP and to maintain the required level of fire water in the raw water tank.

Corrosion identified in various locations within the tank from weld splatter when fitting internal infrastructure.

The operator took immediate steps to address the tank inspections that were overdue at the station and actioned the findings identified. A database has also been created in RWE headquarters to track inspection frequencies on primary containment and associated ancillary pipework. Inspection frequencies depend on several factors which includes type, material stored, manufacturer recommendation and industry best practice. It is important that this work is tracked and undertaken in accordance with written procedures to prevent loss of containment.

Recommendation: Operator to review the boiler blowdown sampling point alongside the seal pit and undertake any necessary maintenance where required.



The boiler blowdown sampling point was inspected during this audit and the retrofitted pipework appeared to be leaking. The operator explained that the sampling pipework was retrofitted following construction to meet the requirements of the permit (condition 3.5.1 table S3.2) and it appears that the welds may have failed where they were joined to the main feeds which extend into the seal pit. The operator fed back on the leaks at the day of the visit. It is acknowledged that health and safety is a priority on this type of hot work as and will need to be addressed accordingly.

Action: Operator to provide an update on the maintenance work at the boiler 'blowdown' sampling point.

Progress on foam reduction and fish return and recovery (FRR) efficiency work

A full-scale acrylic model has been built at the BHR Group (BHR) laboratory to better understand the main cooling water behaviour within the stations 'seal pit' that is producing a visible foam, at the discharge point into the Milford Haven waterway. During this audit several video clips were viewed with the operator showing the experiments by BHR using various structural configurations to break the flow of water over the modelled weir and how this impacts on flow. These experiments were undertaken using a simulated high and low tide water level to see the degree of turbulence / air entrainment and help reduce foam production. This work is on-going, and no decisions have been made to date over any suitable options from this modelling work. The operator continues to demonstrate a commitment to seek improvements to reduce foam from the station.

The work to address the FRR efficiencies was on-going at the time of the visit. At present the operator is replacing the plastic pipework with stainless steel which incorporates rodding points for maintenance of the system. This is a significant piece of work which had to be carefully considered to allow the FRR to continue operating throughout this work with minimal disruption. The timeline has been impacted on partly due to contractual matters however was evident on site at the time of the visit. The following photographs of the removed section of pipework and replacement pipes were taken during the onsite inspection.



The photograph opposite was taken at the MCW intake. Each supply of water to the FRR drum screens is being addressed on a rolling programme for least disruption to the system while making the change to stainless steel pipe.

→ Pile of removed plastic pipe which showed biological growth (mainly mussels) and were present on the ground where they had come out of the redundant pipework.

→ Section of removed pipe to the FRR.



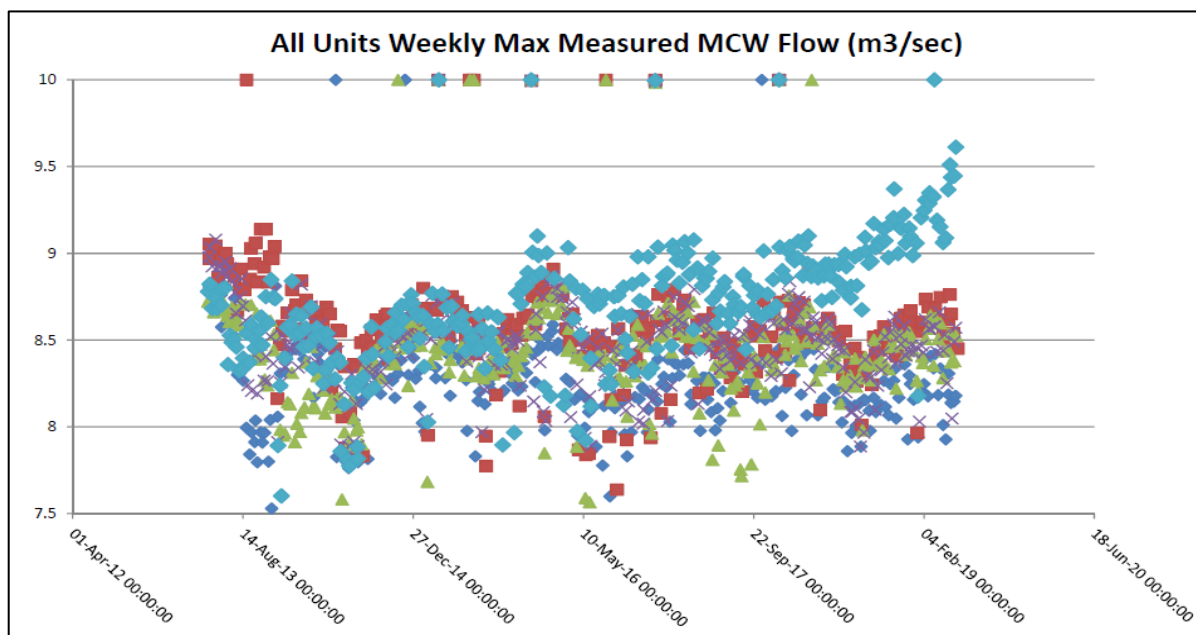
The photograph opposite shows sections of the new stainless steel pipework with rodding points for maintenance. These have been placed at the intake ready for fitting.

It is expected that the stainless steel pipework will improve the flow of water to the FRR and spray bars within the drum screens. This new pipework should help prevent the build up of biological growth within the ancillary elements of the FRR and assist in improved maintenance access resulting in overall efficiencies. The operator has realised that the efficiencies of the system has changed from new and has been committed to make improvements where possible. NRW acknowledges the work identified, implemented and incorporated by the operator to improve the system.

Action: Operator to update NRW on progress with the steps taken to improve efficiencies on the FRR system at the next routine visit.

MCW pump – flowmeter Action plan / timeline

Through the best practice of trending data at the power station the operator identified an issue with the MCW unit 51 flow meter. The operator explained the actions taken following a significant increase in the measurement which required investigating. The operator kept NRW informed of the issue and it was agreed that the calculated value could be used i.e. the pump curve and JEP guidance methodology while the meter was under investigation. The operator and flow meter validation organisation has assessed the flowmeter to identify the root cause of the increased value. It was considered by RWE and the validation inspectors that biological growth was impacting on the measurement and a remotely operated vehicle (ROV) inspection confirmed this. Subsequently the Unit 11 flow meter was also experiencing problems and dropping out again considered to be down to biological growth.



From the trended flow data, it was identified that there was an issue with the unit 51 flowmeter as the data showed a significant increase ($>9.5\text{m}^3$ - teal coloured data points) which can be seen in the graph opposite.

Prior to the visit the MCW unit 11 flow meter had come back-on line and it was considered this was due to die back of the biological growth during the major outage. However, discussions with the operator since this visit has seen a change to the meters circuit board due to a fault which has been replaced and the meter is back on line.

Through the trending of data, the operator has been able to identify an issue straight away and act to resolve it and taken steps in agreement with NRW. The flow data is not only used for operational purposes but to demonstrate compliance with the limits in the environmental permit. In this instance the problems appeared to be associated with the flow meters themselves which were all maintained, calibrated and validated within date. A brief discussion was held with the operator during the audit around the risk posed with this issue and the responsibility on the operator.

Any updates re: Reg 61 (wording of haven monitoring), EBG, outages

A general discussion was held on on-going matters, it was advised that the NRW marine team have requested an extension internally until 16 October 2019 for comments on the operators annual environmental monitoring reports 2018. KD stated that she would send the comments on as soon as possible on receipt. It was discussed that depending on the matters raised a meeting may be required at the end of November early December 2019 to discuss at operational level.

Conclusion

This was a routine audit which sought to review on-going areas of work that included primary containment where a disconnect was identified during the last audit between the LP for 'Civil Assets and Engineering' and the RWE technical procedure. The operator immediately addressed this disconnect through an action plan which was found to be almost complete. There is work that needs to be carried out based on findings of the internal and external tank inspections, but this was well underway at the time of the audit. This is a very busy time at the station with the workforce fluctuating during the major outages to up to 300 people on site. These major outages are being managed by the operator which is a difference from previous 'C' inspections when the turbines were still under warranty. At the time of writing the operator was on the third unit outage out of the five with the remaining two units due for completion in the first quarter of 2020. There were no non-compliances of the environmental permit identified in the areas visited by this audit.

[End]

This form will report compliance with your permit as determined by an NRW officer

Site	Pembroke Power Station	Permit Ref	DP3333TA
Operator/Permit holder	RWE Generation UK Plc	Date	11 October 2019

Section 3 – Enforcement Response

Only one box should be ticked

You must take immediate action to rectify any non-compliance and prevent repetition.

Non-compliance with your permit conditions constitutes an offence and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.

Other than the provision of advice and guidance, at present we do not intend to take further enforcement action in respect of the non-compliance identified above. This does not preclude us from taking enforcement action if further relevant information comes to light or advice isn't followed.	-
In respect of the above non-compliance you have been issued with a warning. At present we do not intend to take further enforcement action. This does not preclude us from taking additional enforcement action if further relevant information comes to light or offences continue.	-
We will now consider what enforcement action is appropriate and notify you, referencing this form.	-

Section 4 – Action(s)

This section summarises the actions identified during the assessment along with the timescales for when they will need to be completed.

Criteria Ref.	CCS Category	Action required/ advised	Due Date
See Section 1 above			
-	-	For all actions see within the text above.	-
		-	-

Section 5 – Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- Advise on corrective actions verbally or in writing
- Require you to take specific actions verbally or in writing
- Issue a notice
- Require you to review your procedures or management system
- Change some of the conditions of your permit
- Decide to undertake a full review of your permit

Any breach of a permit condition is an offence and we may take legal action against you

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and/or suspension or revocation of the permit.

See our Enforcement and Civil Sanctions guidance for further information

This report does not relieve the site operator of the responsibility to

- Ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- Ensure you comply with other legislative provisions which may apply

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance that could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

Section 6 – General information

Data protection notice

The information on this form will be processed by the Natural Resources Wales (NRW) to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s). The NRW may also use and/or disclose it in connection with:

- Offering/providing you with its literature/services relating to environmental matters
- Consulting with the public, public bodies and other organisations (e.g. Health and Safety Executive, local authorities) on environmental issues
- Carrying out statistical analysis, research and development on environmental issues
- Providing public register information to enquirers
- Investigating possible breaches of environmental law
- Assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Regulations request

The NRW may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The NRW will provide a copy of this report to the public register(s). However, if you consider that any information contained in this reports should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within twenty working days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

What can I do if I disagree with this compliance assessment report?

If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with officer's line managers using the informal appeals procedure. If you wish to raise your dispute further through our official Complaints and Commendations procedure, phone our general enquiry number 0300 065 3000 (Mon to Fri 08.00 – 18.00) and ask for the Customer Contact team or send an email to enquiries@naturalresourceswales.gov.uk. If you are still dissatisfied you can make a complaint to the Public Services Ombudsman for Wales. For advice on how to complain to the Ombudsman phone their helpline on 0845 607 0987.