

Compliance Assessment Report CAR_NRW0041255

Permit being assessed: JP3632ZH.

For: Barry CHP , held by Dow Silicones UK Limited

At: Wimborne Road - Dock 2, Barry, Vale of Glamorgan, CF63 3DH.

Type of assessment carried out: Report/Data Review, Reason: Routine.

On 31/12/2022.

Parts of permit assessed: Monitoring Returns

NRW Lead Officer: Geraint Harris.

Report sent to: Jude Sartor, Environmental Specialist on 20/02/2023.

1. Summary of our findings (full details in section 4)

Part of permitted activity assessed (criteria)	Assessment result	Permit condition
G1 - Monitoring and Records, Maintenance and Reporting - Monitoring of emissions and environment	Action only (X)	
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	Action only (X)	
B1 - Infrastructure - Engineering for prevention and control of emissions	Action only (X)	
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	Action only (X)	
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	C4 No impact	Permit condition 4.3.1.
G1 - Monitoring and Records, Maintenance and Reporting - Monitoring of emissions and environment	C4 No impact	permit condition 4.2.3
E1 - Emissions - Air	C3 Minor	permit condition 3.1.4.

Result types are explained in more detail in the 'Important Information' section below.

Total number of non-compliances recorded	Total non-compliance score
3	4.2

How we use the non-compliance score to calculate your annual fee is explained in the 'Important Information' section below.

2. What action is required?

Criteria	Action needed	Complete by
G1	Please respond to the outstanding actions from CAR Form	31/03/2023

Criteria	Action needed	Complete by
	CAR_NRW0040875	
G4	Please amend the reporting forms for air emission point A2 (IED CON 2 (Gas Turbines))	31/03/2023
B1	share your findings, with NRW, into the root cause of the GT upsets and provide NRW with details on Dow's planned preventative maintenance regime for both GT-HRSG A and B.	31/03/2023
G4	Please complete and submit part B of the schedule 5 sent in April 2022 relating to the NOx exceedances in March	31/03/2023
G4	Please send a Schedule 5 Notice for all high NOx emissions in 2022.	31/03/2023
G1	Dow must investigate if their current DAH system reflects the requirements of the permit and JEP Protocol.	28/04/2023
E1	Please update NRW if GTA was combined with HRSG-B to create one operating GT-HRSG?	31/03/2023

Action criteria codes are listed in the 'Important information' section below.

3. What will happen next?

Any non-compliance we have identified and recorded on this form is an offence. It can result in criminal prosecution and/or suspension or revocation of your permit.

At this time, we do not intend to take any further action.

This statement does not stop us from taking additional enforcement action if further relevant information comes to light or offences continue.

4. Details of our assessment

Dow CHP

Fired Boiler

The monitoring results of the Fired boiler following on from the tuning at the end of Q1 are very satisfactory with the results significantly under the permit ELV's. As already mentioned in CAR_NRW0040875, Dow have improvement condition IC8 within their permit which requires them to submit a written CHP post-commissioning report to NRW for approval. Dow have stated that they intend to submit this report after they have had a prolonged period of operation for optimisation of the HP boiler. Now that consistent and stable operation has been demonstrated, NRW expect to receive this report in early 2023.

The monitoring returns received throughout 2022 for the fired boiler have a subtext below them stating the following: "(a) All data based on validated hourly average concentrations, excluding start-up and shut-down and periods of malfunction or breakdown of abatement equipment, at 15% O₂, dry, 273.15K, 101.325 kPa".

Outstanding Action1: Dow need to check that the reported fired boiler emissions are actually referenced to an oxygen concentration of 3% not 15%. **Due 10th of February 2023. Due 31st of March.**

New Action 1: Please amend the reporting forms for air emission point A2 (IED CON 2 (Gas Turbines)) This emission point is for the Fired Boiler and so the correct reference conditions mentioned above need to be applied and stated in the form. Also, since A2 is a boiler, please can you amend the form by replacing the

words 'Gas Turbines' with 'Boiler'. **Due 31st of March.**

GT-HRSG-A (Unit A) Emission Point A1

There have been a number of operational issues related to the running of GT-HRSG-A in 2022. GTA was operational for 61 hours during 2022 (all but 10 hours were during Q1). After the planned shutdown, Dow have struggled to run at higher rates or run the GT due to issues with the burners and the air/gas flow "blowing" the flames out or away from the flame sensors. Due to the fired boiler being out of action for statutory inspection in Q4, HRSG-A had to be put into action to make up the steam deficit. This unit is currently limited to 25tonnes of steam to prevent the current flame issues. This means the HRSG A has been running in FD mode sometimes >25te/hr steam, sometimes < 25te/hr steam. The Q4 monitoring results provided by Dow show an exceedance of both the daily and monthly ELV's for emission point A1. However, according to the JEP protocol (Electricity Supply Industry – IED Compliance Protocol for Utility Boilers and Gas Turbines (LCP BREF Update), Joint Environmental Programme) concessions can be made for plant that run in forced draft mode (auxiliary mode). In summary for auxiliary firing, the oxygen reference condition for reporting and the boiler ELV reference shall therefore also be increased to 15% O₂ (for short periods when the gas turbine is unavailable). The boiler ELV is taken to be the same numerical value as that applied at 3% O₂. However, in these situations, the Operator shall provide a credible recovery plan for the gas turbine to the competent authority and agree a course of action. When a credible recovery plan cannot be agreed, or is not appropriate, then the auxiliary firing then needs to comply with the original boiler ELV at 3% O₂ (for convenience this ELV can be divided by 3 if reporting continues at 15% O₂).

In this instance Dow had to operate unit A to maintain steam for the main activities on site while the fired boiler was undergoing inspection. Dow expect the fired boiler to be back online in February 2023. Once the fired boiler is back in action Unit A will be taken down for an investigation and the Dow tech centre specialists will be helping them. Dow believe there may be an issue with the burners following their removal to repair a crack last year. Dow have repeatedly stated that it is in their best interest to run GT's since in addition to having lower NO_x emissions they will also save a considerable amount of money. Dow, after observing that HRSG-B operates at a much lower NO_x level than HRSG-A, are planning on combining GTA with HRSG-B to create one operating GT-HRSG. Since there is a plan in place to bring the operations back into compliance it has been decided that the original boiler ELV shall be used for compliance purposes. This boiler ELV will be taken to be the same numerical value as that applied at 3% O₂. Therefore, the following ELV's will apply:

The original boiler ELV's (referenced to 3% O₂, dry, 273.15K, 101.325 kPa) according to IED annex V part 1 (6) and part 4 (1) are:

- 100 mg/Nm³ monthly mean of validated hourly averages
- 110 mg/Nm³ Daily mean of validated hourly averages
- 200 mg/Nm³ 95% of validated hourly averages within a calendar year

Therefore, the monthly mean for October is the only value considered a breach. Due to the limited impact of these raised NO_x emissions this is only considered a **Category 3 noncompliance** against permit condition 3.1.4.

Outstanding Action 2: At what load is GT-A operating at? Is the current DAHS capable of separating out part load operations? **Due 10th of February 2023.** After a Microsoft teams conversation with Dow, this action does not need to be responded to. The GT's are not being ran in part load operations.

Outstanding Action 3: Are you able to provide a breakdown on the number of hours HRSG-A and B were operated both below and above the 25tonnes/hr of stream. **Due 10th of February 2023. Due 31st of March.**

GT-HRSG-B (Unit B) Emission Point A3

Dow were unable to run their GT on unit B since the middle of March due to a defect on the top throat damper. After the extended shutdown period, 18th of October, Dow's GTB would not work and was taken to Ethos in Scotland to be fixed. According to Dow "there is internal damage to compressor fins that we do not yet know how it happened. We will get a report back from Ethos regarding what happened". As a consequence of the issues with the GT, Dow have been running hard in FD mode >25te/hr steam since March. While operating in FD mode Dow have exceeded their permit ELV's in June. However, the same approach regarding the original boiler ELV for unit a (mentioned above) is being taken and so no noncompliance is being issued.

Annual Mean

Please be aware that since IP7 has been accepted the annual mean ELV of 55 mg/m³ is now in effect. For the annual limit, BAT-AELs apply only when the Dry Low NO_x (DLN) system is 'effective'. The DLN system is part of the GT's and so while the GT's are not operating the DLN system is not 'effective'. Therefore, the annual mean ELV does not apply when operating in FD mode. Therefore, no exceedances of the annual average have been recorded.

Root Cause

New Action 2: When a noncompliance is recorded a root cause must be identified. Please can you share your findings with NRW when you undertake your investigations into the cause of the plant upsets for both GTA and GTB. Please can you also provide details on Dow's planned preventative maintenance regime for both GT-HRSG A and B.

Schedule 5 Noncompliance's

NRW received a schedule 5 notice for the elevated NO_x emissions from the CHP unit A in March. NRW have not received a part B for this schedule 5.

New Action 3: Please complete the part B and return to NRW. **Due 31st of March 2023.**

NRW have not received a Schedule 5 Notice for the high NO_x emissions for October for unit A. As a result, a **noncompliance category 4** is being issued against permit condition 4.3.1.

New Action 4: Please send a Schedule 5 Notice for all high NO_x emissions in 2022. **Due 31st March 2023.**

Invalid data

As stated in the previous car form and in the JEP Protocol, there are specific rules pertaining to what constitutes valid daily and monthly means. The results for emission point A1 in March are a result of 5 hours of operation therefore they do not constitute a valid daily or monthly average. Therefore, they should not be reported on the Form IED CON 2. As a consequence, a **noncompliance category 4** is being issued against permit condition 4.2.3 for failure to submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit. Dow must make sure that what they report reflects the requirements of the Permit and JEP Protocol. Dow's DAH's system should reflect the requirements of both the permit and the Protocol so that any irrelevant data is omitted from their reports.

New Action 5: Dow must investigate if their current DAH system reflects the requirements of the permit and JEP Protocol. **Due April 28th 2023.**

OMA Audit

It is NRW's intention to undertake an OMA audit of the CHP in Late April.

End.

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If you have any queries about this report, or to discuss completion of any actions, please contact the NRW Officer named above.

Important information

Legal status of this report

Your permit is issued to you under the Environmental Permitting Regulations. You have a responsibility to comply with the conditions of your permit and prevent pollution/harm of the environment. You must also ensure that you comply with any other relevant legislation that may apply to your site's operations.

This report explains the findings of our assessment and any action you are required to take. We categorise non-compliance using our guidance for assessing non-compliance at regulated sites.

When we find potential non-compliance/s we will normally give you advice on how to maintain compliance.

To correct non-compliance, we may:

- require you to take specific actions
- issue a notice
- review the conditions of your permit.

Any advice and guidance we give will be without prejudice to any other enforcement response that we consider may be required.

Assessment results and non-compliance categories (used in section 1):

Assessment result	Description
Assessed (A)	Assessed or assessed in part, no evidence of non-compliance found
Action only (X)	Action only relating to the activity assessment
Ongoing (O)	Ongoing non-compliance, not scored

Non-compliance category	Description	Score
C1 Major	Potential to have a major, serious, persistent and/or extensive impact or effect on the environment, people and/or property	60
C2 Significant	Potential to have a significant impact or effect on the environment, people and/or property	31
C3 Minor	Potential to have a minor or minimal impact or effect on the environment, people and/or property	4
C4 No environmental impact	Non-compliance at a regulated site that cannot foreseeably have any impact on the environment, people and/or property	0.1

How we use assessment scores

The number and severity of non-compliances recorded in a year will affect your annual subsistence fee the following year. A non-compliance factor is added to your site's Operator

Performance Risk Appraisal (OPRA) score when we calculate your fee to reflect the additional resource we use to assess permit compliance.

What are suspended scores?

In line with our guidance, we may suspend scores for up to six months to allow time for remedial action to be taken. Suspended scores will be re-instated if the action is not completed.

Full list of Industry and Waste action criteria (used in section 1 and 2):**A: Permitted activities**

- A1 Specified by permit

B: Infrastructure

- B1 Infrastructure – Engineering for prevention and control of emissions
- B2 Infrastructure – Closure and decommissioning
- B3 Infrastructure – Site drainage engineering (clean and foul)
- B4 Infrastructure – Containment of stored materials
- B5 Infrastructure – Plant and equipment

C: General management

- C1 General management – Staff competency/training
- C2 General management – Management system and operating procedures
- C3 General management – Materials acceptance
- C4 General management – Storage, handling, labelling and segregation

D: Incident management

- D1 Incident management – Site security
- D2 Incident management – Accidents, emergency and incident planning

E: Emissions

- E1 Emissions – Air
- E2 Emissions – Land and groundwater
- E3 Emissions – Surface water
- E4 Emissions – Sewer
- E5 Emissions – Waste

F: Amenity

- F1 Amenity – Odour
- F2 Amenity – Noise
- F3 Amenity – Dust/fibres/particulates and litter
- F4 Amenity – Pests/birds and scavengers
- F5 Amenity – Deposits on road

G: Monitoring and records, maintenance and reporting

- G1 Monitoring and records, maintenance and reporting – Monitoring of emissions and environment
- G2 Monitoring and records, maintenance and reporting – Records of activity, site diary/journal/events
- G3 Monitoring and records, maintenance and reporting – Maintenance records
- G4 Monitoring and records, maintenance and reporting – Reporting and notification to Natural Resources Wales

H: Resources efficiency

- H1 Resource efficiency – Efficient use of raw materials
- H2 Resource efficiency – Energy efficiency

Enforcement response

Any permit condition non-compliance is an offence and we may take legal action against you. Action we take can include prosecution, serving a notice on you and/or suspension or revocation of your permit. See our Enforcement and Sanctions Guidance for further information.

Data protection notice

You should make sure that anyone named in this report knows that the information it contains will be processed by Natural Resources Wales to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s).

We may also use and/or disclose the report in connection with:

- offering or providing you with our literature or 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 our service
- Freedom of Information Act or Environmental Information Regulations requests.

We may also pass it on to our agents or representatives to do these things on our behalf.

Disclosure of information – this report will be available to view on-line

If you think this report contains commercially confidential information that should not be placed on our public register, you must contact your local Natural Resources Wales office within **fifteen working days** of receiving this report, using the contact details in the accompanying email or letter. You must give a full explanation of why it should not be added to our public register, including specifying which information is commercially confidential. We will assess your request and respond to you within 20 working days to let you know if we agree to your request.

What do I do if I disagree with the report or have a complaint?

If you disagree with this compliance assessment report, you should contact the lead officer without delay to discuss your concerns.

If you are unable to resolve the issue with the lead officer or their line manager you should contact our Customer Contact team on 0300 065 3000 (Monday to Friday 08:00 – 18:00), or email enquiries@naturalresourceswales.gov.uk for details of how to raise your dispute further through our Complaints and Commendations procedure.

If you are dissatisfied with our response, you can contact the Public Services Ombudsman for Wales by phone on 0300 7900203 or by email at ask@ombudsman.wales

Welsh Language Standards

We are committed to establishing Natural Resources Wales as a naturally bilingual organisation. We will provide compliance reports in your preferred language.