

Environment Agency

Review of an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2010 (as amended)

Decision document recording our decision-making process following review of a permit

The Permit number is: EPR/TP3532PK
The Operator is: Huntsman P&A UK Limited
The Installation is: Greatham Works
This Variation Notice number is: EPR/TP3532PK/V008

What this document is about

All Environmental permits which permit the operation of large combustion plant (LCP), as defined by articles 28 and 29 of the Industrial Emissions Directive (IED), need to be varied to implement the special provisions for LCP given in the IED, by the 1 January 2016 (Article 82(3)). The IED makes special provisions for LCP under Chapter III, introducing new Emission Limit Values (ELVs) applicable to LCP, referred to in Article 30(2) and set out in Annex V.

The IED provides a period of transition towards the new ELVs via Article 32, the Transitional National Plan (TNP). It also makes provision for plant that wish to be exempted from compliance with the new ELVs in Article 33, the Limited Life Derogation (LLD). Other derogations include limited operating hour regimes for sites using 500 hr or 1500 hr derogations. There are also options for exemption from emission limits based on operating hours.

The operator has submitted a response to our notice requiring information, issued under regulation 60(1) of the Environmental Permitting Regulations (EPR), which has provided us with information on which compliance route they wish to follow for each LCP. The response also includes specific details relating to each LCP, necessary for accurate implementation of the IED requirements. A copy of the regulation 60 notice and the operator's response is available on the public register.

We have reviewed the permit for this installation, including all variations since the last permit consolidation, and referred to the operator's responses to the regulation 60 notice requiring information. This is our decision document, which explains the reasoning for the consolidated variation notice that we have issued.

It explains how we have reviewed and considered the compliance routes and, where relevant, the emissions limits proposed by the operator for each LCP on the installation. This review has been undertaken with reference to the:

- Chapter III and annex V of the IED
- “IED BAT Non-ESI Review Paper, 28 October 2014” produced by the Environment Agency (referred to as the “2014 Non-ESI BAT review paper” in this document)
- “Electricity Supply Industry – IED compliance protocol for Utility Boilers and Gas Turbines”, published by the Joint Environmental Programme.

It is our record of our decision-making process and shows how we have taken into account all relevant factors in reaching our position. It also provides a justification for the inclusion of any specific conditions in the permit that are in addition to those included in our generic permit template.

As well as implementing the chapter III IED compliance of the installation, the consolidated variation notice takes into account and brings together in a single document all previous variations that relate to the original permit issue.

We have changed the operator name from Tioxide Europe Limited to Huntsman P&A UK Limited. The legal entity/company registration number remains unchanged.

In this document we address our determination of substantive issues relating to chapter III review and any changes to the operation of the installation.

How this document is structured

Glossary

1. Our decision
2. How we reached our decision
3. The legal framework
4. Key Issues

Annex 1 – Review and assessment of changes that are not part of the Chapter III IED derived permit review.

GLOSSARY

| | |
|---------------|---|
| BAT | best available techniques |
| BREF | best available techniques reference document |
| Derogation | as set out in Article 15(4) of the IED |
| Emergency use | <500 operating hours per annum |
| ELV | emission limit value set out in either IED or LCPD |
| IED | Industrial Emissions Directive 2010/75/EC |
| LCP | large combustion plant – combustion plant subject to Chapter III of IED |
| LCPD | Large Combustion Plant Directive 2001/80/EC |
| LLD | Limited Life Derogation |
| MCR | Maximum Continuous Rating |
| MSUL/MSDL | Minimum start up load/minimum shut-down load |
| TNP | Transitional National Plan |

1 Our decision

We have decided to issue the Variation Notice to the operator. This will allow it to continue to operate the Installation, subject to the conditions in the Consolidated Variation Notice.

We consider that, in reaching that decision, we have taken into account all relevant considerations and legal requirements and that the varied permit will ensure that a high level of protection is provided for the environment and human health.

The Consolidated Variation Notice contains several conditions that concern the operation of the non-LCP part of the installation taken from our standard Environmental Permit template including the relevant annexes. We developed these conditions in consultation with industry, having regard to the legal requirements of the Environmental Permitting Regulations and other relevant legislation. This document does not therefore include an explanation for these standard conditions. Where they are included in the Notice, we have considered the techniques identified by the operator for the operation of their installation, and have accepted that the details are sufficient and satisfactory to make those standard conditions appropriate. This document does, however, provide an explanation of our use of “tailor-made” or installation-specific conditions, or where our Permit template provides two or more options.

2 How we reached our decision

2.1 Requesting information relating to the requirements of Chapter III of and Annex V to the IED

We issued a Notice under Regulation 60(1) of the Environmental Permitting (England and Wales) Regulations 2010 (a Regulation 60 Notice) on 31/10/14 requiring the operator to provide information for each LCP they operate, including:

- The type of plant, size and configuration.
- The proposed compliance route.
- Minimum start up and shut down loads.
- The proposed emission limits and how they accord with the 2014 BAT review paper.
- A request to move from monthly to 6 monthly monitoring for sulphur dioxide (SO₂) and oxides of nitrogen (NO_x).

The Regulation 60 Notice response from the operator was received on 23/03/15.

We considered that the response did not contain sufficient information for us to commence determination of the permit review. We therefore issued a further information request to the operator as follows:

| Request | Date Received | Comments |
|---------------------------------|---------------|---|
| Regulation 60 Notice response | 25/03/15 | Response received from the operator to our request dated 31/10/14 |
| Additional information received | 15/06/15 | Response to RFI dated 13/05/15 Q364-LCP configuration Q365-Method for derivation of the net rated thermal input Q366-MSUL & MSDL Q367-ELVs Q369-monitoring |

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review.

The operator made no claim for commercial confidentiality. We have not received any information in relation to the Regulation 60 Notice response that appears to be confidential in relation to any party.

3 The legal framework

The Consolidated Variation Notice will be issued under Regulations 18 and 20 of the EPR. The Environmental Permitting regime is a legal vehicle which delivers most of the relevant legal requirements for activities falling within its scope. In particular, the regulated facility is:

- an *installation* as described by the IED;
- subject to aspects of other relevant legislation which also have to be addressed.

We consider that, in issuing the Consolidated Variation Notice, it will ensure that the operation of the Installation complies with all relevant legal requirements and that a high level of protection will be delivered for the environment and human health.

We explain how we have addressed specific statutory requirements more fully in the rest of this document.

Meeting the requirements of the IED

The table below shows how each requirement of the IED has been addressed by the permit conditions.

| IED Article Reference | IED requirement | Permit condition |
|------------------------------|--|------------------------------|
| 30(6) | If there is an interruption in the supply of gas, an alternative fuel may be used and the permit emission limits deferred for a period of up to 10 days, except where there is an overriding need to maintain energy supplies. The EA shall be notified immediately. | Not Applicable |
| 32(4) | For installations that have applied to derogate from the IED Annex V emission limits by means of the transitional national plan, the monitoring and reporting requirements set by UK Government shall be complied with. | 2.2.1.4 Table 2.2.3 |
| 33(1)b | For installations that have applied to derogate from the IED Annex V emission limits by means of the Limited Life Derogation, the operator shall submit annually a record of the number of operating hours since 1 January 2016; | Not Applicable |
| 37 | Provisions for malfunction and breakdown of abatement equipment including notifying the EA. | Not Applicable |
| 38 | Monitoring of air emissions in accordance with Ann V Pt 3 | 2.2.1.3, 2.2.1.7 |
| 40 | Multi-fuel firing | Not Applicable |
| 41(a) | Determination of start-up and shut-down periods | 2.1.4 Table 2.1.2 |
| Ann V Pt 1(1) | All emission limit values shall be calculated at a temperature of 273,15 K, a pressure of 101,3 kPa and after correction for the water vapour content of the waste gases and at a standardised O ₂ content of 6 % for solid fuels, 3 % for combustion plants, other than gas turbines and gas engines using liquid and gaseous fuels and 15 % for gas turbines and gas engines. | Section 6, Interpretation |
| Ann V Pt 1 | Emission limit values | 2.2.1.3 Table 2.2.2 |
| Ann V Pt 1 | For plants operating less than 500 hours per year, record the used operating hours | Not Applicable |
| Ann V Pt 1(6(1)) | Definition of natural gas | Section 6, Interpretation |
| Ann V Pt 2 | Emission limit values | 2.2.1.3 Table 2.2.2 |

| IED Article Reference | IED requirement | Permit condition |
|------------------------------|--|-------------------------|
| AnnV Pt 3(1) | Continuous monitoring for >100MWth for specified substances | Not Applicable |
| AnnV Pt 3(2, 3, 5) | Monitoring derogations | 2.2.1.3 Table 2.2.2 |
| AnnV Pt3(4) | Measurement of total mercury | Not Applicable |
| AnnV Pt3(6) | EA informed of significant changes in fuel type or in mode of operation so can check Pt3 (1-4) still apply | Not Applicable |
| AnnV Pt3(7) | Monitoring requirements | Not Applicable |
| AnnV Part 3(8,9,10) | Monitoring methods | 2.2.1.3, 2.2.1.7 |
| AnnV Pt 4 | Monthly, daily, 95%ile hourly emission limit value compliance | Not Applicable |
| AnnV Pt7 | Refinery multi-fuel firing SO ₂ derogation | Not Applicable |

4. Key Issues

Unless the decision document specifies otherwise we have accepted the applicant's proposals.

Where relevant and appropriate, we have incorporated the techniques described by the operator in their Regulation 60 Notice response as specific operating techniques required by the permit, through their inclusion in Table 2.1.1 of the Consolidated Variation Notice.

The variation notice uses an updated LCP number in accordance with the most recent DEFRA LCP reference numbers. The LCP reference has changed as follows:

- **LCP 80** is changed to **LCP 354**

Configuration-LCP 354:

The boiler plant comprises four natural gas fired boilers (2, 4, 5 & 6) which discharge via a common single stack/windshield at emission point A250. The boilers have a combined thermal input of 80 MW:

Boiler 2 at 21.4 MW; and
Boilers 4, 5, 6 each at 19.5 MW.

The LCP does not operate on standby fuels.

The LCP reference is added to Tables 1.1.1, 2.1.2, 2.2.1, 2.2.2, 2.2.3 and S4.2 of the permit.

We have added the LCP definition to Section 6 Interpretation.

Compliance Route:

The operator has proposed to operate LCP 354 under the ELV compliance route with the exception of oxides of nitrogen (NO_x) where the TNP compliance route applies.

For plant operating under the TNP, ELVs are set which have been derived for the period 2016 – 30 June 2020 (the duration of the TNP). At the end of this period it is expected that both Annex V and the revised LCP BREF will become applicable, in which case Annex V or the BAT conclusions must be achieved (whichever is stricter), or operators must have applied for a derogation from the BAT conclusion (if that is stricter: Annex V will apply in any event). The operator will apply, at the appropriate time, to vary the permit again to reflect this.

The operator's current proposals to achieve the stricter ELVs by 30 June 2020, are to review of options, including the retrofitting of low NO_x burners and/or the installation of selective catalytical filters. The best option will be

decided based on a combination of technical feasibility, robustness, ease of operation and maintenance and capital cost. This information is not in any way binding upon the operator and may change.

These compliance routes are incorporated into the sites operating techniques by inclusion in Table 2.1.1 of the permit.

We have added condition 2.1.3 which requires LCP 354 to be operated in accordance with the IED Compliance protocol.

We have amended condition 4.1.8. This is required for LCPs under the TNP to enable quarterly reporting of mass emissions.

Net Rated Thermal Input:

The operator has stated that the Net Thermal Input is 80 MWth. They have justified this figure by providing information supplied by the boiler manufacturers. This information dates back to the 1970s and the operator confirmed that they no longer have the original documentation.

They calculated an operating net thermal input by reviewing the daily gas usage (m³) for each boiler during the last five years and selecting the maximum daily gas usage. This has been converted to a thermal input assuming a GCV of 40 MJ/m³ for natural gas:

$$\text{Boiler thermal rating (MW)} = \frac{\text{Gas volume (m}^3\text{) used in day X GCV}}{24 \times 3600}$$

| Boiler Number | Manufacturers thermal input rating (MW) | Highest gas usage in last five years (m³/day) | Calculated thermal input rating (MW) |
|----------------------|--|---|---|
| 2 | 21.4 | 41,403 | 19.2 |
| 4 | 19.5 | 41,197 | 19.1 |
| 5 | 19.5 | 35,243 | 16.3 |
| 6 | 19.5 | 40,571 | 18.9 |
| TOTAL | 79.9 | | 73.5 |

We are satisfied with the information provided and have included manufacturer’s thermal input in the permit.

Minimum start up load and Minimum shut-down load:

The operator has defined the “minimum start up load” and “minimum shut-down load” for LCP 354 in their response to question 366 of the Reg 60, in terms of the following two criteria:

- Steam pressure >< 21.5 barg
- Steam temperature >< 230°C

In their RFI response received 15/06/15 they confirm that the key operating parameter is the amount of steam in tonnes/hour. The minimum start-up and shut-down load is 7 tonnes/hour.

These three criteria suit the technical characteristics of the plant, which can be met at the end of start-up or start of shut-down.

We agree with all of these definitions and have set these thresholds in table 2.1.2 of the permit accordingly. Standard permit condition 2.1.4 has been set to define the period of start up and shut down, referring to the thresholds in this table. We have also incorporated into the sites operating techniques by inclusion in Table 2.1.1 of the permit and added the definitions (MSDL/MSUL) to Section 6 Interpretation.

Emission limits:

The operator has proposed limits in line with annex V of the IED for all substances with the exception of oxides of nitrogen (NO_x) where the TNP compliance route has been proposed.

| Parameter | Existing mg/m ³ | Annex V mg/m ³ | New Permit limit mg/m ³ |
|-----------------------|-------------------------------|------------------------------|---------------------------------------|
| NO _x (TNP) | 500 | 110 | 400 |
| CO | No limit | 110 | 110 |
| SO ₂ | 400 | 35 | 35 |
| Dust | No limit | 5 | 5 |

We have accepted the proposed limits and incorporated them into table 2.2.2 of the permit.

Annual limits:

Table 2.2.3 is amended to include the TNP limits for LCP 354. This applies to LCPs within the scope of the TNP.

This table refers to a TNP register. We have added a definition to Section 6 Interpretation.

We amended condition 2.2.1.4 which makes reference to Table 2.2.3.

We added an improvement condition requiring submission of emissions of particulate matter, sulphur dioxide and oxides of nitrogen for LCP 354 for the period 01/01/15 to 31/12/15. This is required for all LCP sites.

Energy efficiency:

There are no additional conditions that apply as the installation does not have CHP and the current permit does not require a CHP review to be carried out periodically.

We have added the definition to Section 6 Interpretation.

Standby fuels:

LCP 354 does not operate on standby fuels.

Monitoring & standards:

Standards for assessment of the monitoring location and for measurement of oxygen, water vapour, temperature and pressure have been added to the permit template for clarity.

Table 2.2.2 requires the operator to confirm compliance with BS EN 15259 in respect of monitoring location and stack gas velocity profile in the event there is a significant operational change (such as a change of fuel type) to the LCP.

We added condition 2.2.1.7 to implement the monitoring requirements in Annex V of the IED.

We amended Table S4.2 to include parameters for LCP 354.

The site inspector requested that an improvement condition was included to allow for dust monitoring to be undertaken at emission point A250. Instead, we have set reporting of dust emissions based on emission factors. This is based on the compliance protocol which states that natural gas is an ash-free fuel and high efficiency combustion does not generate additional particulate matter. The fuel gas is always filtered resulting in a lower dust concentration in the flue than in the surrounding air.

Annex 1: Review and assessment of changes that are not part of the Chapter III IED derived permit review.

| Industrial Emissions Directive (IED) | |
|--|--|
| Implement the requirements of Chapter II of the IED | |
| 2.10.11 | Condition added to implement the protection of soil and groundwater monitoring. |
| 5.1.1 and 5.1.2 | Conditions relating to notifications have been amended. |
| Section 6 Interpretation | Definition for Industrial Emissions Directive added. |
| Other Changes | |
| Table 2.2.1 | Removal of emission points A38 and A206 as agreed by the Environment Agency. |
| Table 2.2.2 | A19, A202 – hydrogen chloride and particulate monitoring frequency changed from monthly to annual as agreed by the Environment Agency. |
| | A122/1 & A122/2 – sulphur dioxide and carbon monoxide monitoring methods updated to BS EN 15267-3 |
| Table 2.2.5 | pH, suspended solids, cadmium, mercury, lead, zinc, iron, chromium, vanadium, copper, nickel and arsenic monitoring methods updated at W1. |
| | pH monitoring method updated at W2, W3, W5 and W6 |
| Section 6 Interpretation | “Daily composite sample” amended, as agreed by the Environment Agency. “Natural gas” added. “Operational hours” added. |