

Environment Agency

Review of an Environmental Permit under the Environmental Permitting (England & Wales) Regulations 2016

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

The Permit number is: EPR/TP3633NH
The Operator is: Total Lindsey Oil Refinery Limited
The Installation is: Total Lindsey Oil Refinery
This Variation Notice number is: EPR/TP3633NH/V003

A Variation Notice EPR/TP3633NH/V003 has been issued to consolidate all previous variations to the conditions of permit TP3633NH.

What this document is about

All Environmental permits which permit the operation of large combustion plant (LCP), need to be varied to implement the specific provisions for LCP (as defined by articles 28 and 29 of the IED), given in the Industrial Emissions Directive (IED), Chapter III (Ch III), which introduce new Emission Limit Values (ELVs) and monitoring requirements that are set out in Annex V, Part 1 of which is applicable to existing LCP (as defined in Article 30(2)).

Article 32 of the IED provides a period of transition towards the new ELVs for some combustion plants via the Transitional National Plan (TNP), however this is not applicable to refinery combustion plants.

In order to assess the operator's ability to comply with IED Ch III, in relation to refinery combustion plants, we issued a notice requiring information, under regulation 60(1) of the Environmental Permitting Regulations (EPR). The information requested for each permitted LCP included details of the type and size of the unit and the types of fuels which it burns. A copy of the regulation 60 notices and the operator's response is available on the public register.

This is our decision document, which explains the conditions of the consolidated variation notice that we have issued and is a record of our decision-making process that shows how we have taken into account all relevant factors in reaching our position.

How this document is structured

Glossary

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

Annex 1: Copy of Regulatory Position Statement RPS/EPR/TP3633NH/V003
01/02/17.

5.

GLOSSARY

BAT	best available techniques
BREF	best available techniques reference document
CCGT	combined cycle gas turbine
DEFRA	Department for the Environment, Food and Rural Affairs
EIONET	Environmental Information and Observation Network
ELV	Emission limit value set out in either IED or LCPD
EPR	Environmental Permitting (England and Wales) Regulations 2016
GT	gas turbine
IED	<i>“Industrial Emissions Directive”</i> means Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) as published in The Official Journal
LCP	Large combustion plant – combustion plant subject to Chapter III of IED
LCPD	large combustion plant directive 2001/80/EC
MCR	maximum continuous rating
MFF	multi fuel fired
MFF Protocol	IED Chapter III Protocol for Multi-fuel Firing Refinery Combustion Plants granted a Permit prior to 7th January 2013, version 5.
OCGT	open cycle gas turbine
NERP	National Emissions Reduction Plan
WHB	waste heat boiler

1 Our decision

We have decided to issue Variation Notice EPR/TP3633NH/V003 to the Operator. This permits them to continue to operate the Installation, subject to the conditions in the notice.

We consider that, in reaching this 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.

2 How we reached our decision

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

We issued notices under Regulation 60(1) of the EPR 2010 (Regulation 60 Notice) on 05/08/2015 requiring the Operator to provide information for each large combustion plant (LCP) on the refinery including:

- The type, size and configuration of the combustion plant
- Specification of the fuels which the LCP can fire and for multi-fuel fired plant, the range of fuel firing ratios that could be used by the plant
- Details of the proposed method for assigning periods of start-up and shutdown
- For multi-fuel fired plants; a proposed methodology for assessing which ELVs should apply, as calculated in accordance with Articles 40(2), or set according to Article 40(3) and procedure for verifying compliance with the relevant ELV
- For higher efficiency gas turbines where they wish to apply for the emission limit derogation (Annex V, Part 1 paragraph 6, note 2), the energy efficiency details of the LCP.

The responses to the Regulation 60 Notices were received from the Operator on 30/09/2015. We considered the responses were in the correct form and contained sufficient information for us to begin our determination of the permit reviews.

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

3 The legal framework

The 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.

We consider that, in issuing the Consolidated Variation Notice, this 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 Chapter III

The table below shows how relevant requirements of IED ChIII have been addressed by the permit conditions.

IED Article Reference	IED requirement	Permit condition
30(2)	Setting emission limit values for plant granted a permit before 7 January 2013	3.1.2
37	Notification of malfunction and breakdown of abatement equipment	4.3.1 and Schedule 5
38	Monitoring of air emissions in accordance with Annex V Pt 3	3.5, 3.6
39	Application of compliance criteria to emission limit values in accordance with Annex V Part 4	Schedule 3, Table S3.1
40	Multi-fuel firing	Schedule 3, Table S3.1
41(a)	Determination of start-up and shut-down periods	2.3.4 Schedule 1, Table S1.2
Annex V Pt 1	Emission limit values for plant permitted before 7 th January 2013	Schedule 3, Table S3.1
Annex V Pt 1(6(1))	Definition of natural gas	Schedule 6, Interpretation

4. Key Issues

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

The table below summarises the amendments to permit conditions and related tables and schedules following the issue of the variation and consolidation. Detailed information is provided in the subsequent paragraphs.

Conditions	
2.3.4 and Table S1.2	Condition added relating to specification of start-up and shutdown periods for LCP as specified in table S1.2
3.1.4	Template IED condition added to specify the requirement of periodic groundwater and soil monitoring requirements.
3.6.1	Template condition added relating to monitoring requirements under IED for LCP.
3.6.2	Template condition added relating to action required in the event of CEMS monitoring results for > 10 days a year being invalid.
3.6.7	Template IED condition added relating to CEMS monitoring requirements for LCP.
Table S1.1	Amended to amended to reflect the current plant configuration.
Table S1.3	Amended to update completion dates for outstanding Improvement Conditions, and to show Improvement Conditions that have been completed.
Table S4.1	Renumbered to S3.1 in line with modern template. Inclusion of LCP emission limit values and monitoring requirements in line with IED. Where tighter emission limits already apply, these remain unchanged. Notes to table: <ul style="list-style-type: none"> • removed where no longer relevant; • added to reflect IED requirements.
Table S4.4a	Table renumbered to S3.3 following deletion of table S4.4b and reflecting modern template and amended to remove historic SO ₂ limits.
Table S4.4b	NERP allocation table removed as historic NERP limits no longer apply.
Tables S5.1, S5.3 and S5.4	Renumbered to S4.1, S4.2 and S4.4 in line with modern template and updated to include monitoring and reporting (including reporting forms) for LCP plant.
Schedule 7	Renumbered to Schedule 6 in line with modern template and interpretations amended/added to incorporate terms relevant to IED

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 S1.2 of the Consolidated Variation Notice.

The variation notice uses updated LCP numbers in accordance with the most recent DEFRA EIONET LCP reference numbers. The LCP references have changed as follows:

- **LCP 22** is changed to **LCP 356**;
- **LCP 23** is changed to **LCP 357**;
- **LCP 24** is changed to **LCP 358**;

- **LCP 25** is changed to **LCP 359**;
- **LCP 26** is changed to **LCP 355**.

The table below summarises the rating, configuration and fuel options for each LCP.

LCP Number and source	Unit rating MW	Configuration	Total stack MW	Fuel options
LCP 356	1 x 90	Vent via a single windshield at emission point A1	90	Firing on RFG and Natural Gas.
LCP 357	1 x 35 1 x 30 1 x 22 2 x 19	Vent via a single windshield at emission point A2 .	125.0	Firing on RFG and Natural Gas.
LCP 358	1 x 80 1 x 43 1 x 30.18 3 x 20	Vent via a single windshield at emission point A3 .	213.18	Firing on RFG and Natural Gas.
LCP 359	Decommissioned	Emission point A4 removed from Permit.	-	-
LCP 355	1 x 120 1 x 100	Vent via a single windshield at emission point A6/A6a .	220.0	Firing on RFG and Natural Gas.

Fuel Options

Gaseous fuels include natural gas, refinery fuel gas (RFG).

Net Rated Thermal Input

Some of the ELVs set in Annex V vary according to the Net Rated Thermal Input of the Combustion Plant. In other words how much fuel it is designed to burn. The Applicant has provided the Net Thermal Input for each LCP, as above, along with historical evidence of fuel usage to support these values.

Minimum start-up load and Minimum shut-down load

Article 14(1)(f) of IED requires that provision is made in the permit conditions for “other than normal” operating conditions such as start-up and shut down operations. We have addressed this in section 2.3 ‘Operating Techniques’ of the permit. It is necessary therefore to define the period of start-up or shut-down. The Operator has defined the “minimum start-up load” and “minimum shut-down load” for each LCP in their response to question 2f of the Regulation 60 Notice, in terms of three criteria that 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. Reference to the definitions in the Regulation 60 response have been incorporated into the operating techniques specified in Table 1.2. These are referenced in standard permit condition 2.3.4, which defines the period of start-up and shut-down.

Compliance Route

Article 32(1)(b) excludes LCPs firing distillation and conversion residues from the refining of crude oil, from inclusion in the transitional national plan.

The above LCPs are covered by IED Article 30(2) which applies to all permits for installations containing combustion plants which have been granted a permit before 7 January 2013. Annex V Part 1 sets out emission limit values (ELVs) for combustion plants referred to in Article 30(2); unless a derogation or special provision, such as that given in article 40(3) for MFF plant firing distillation and conversion residues, applies.

The operator has not applied to rely on any derogation provision in article 30 from the ELVs specified in Annex V. Details of the sections of the IED that are relevant for setting emission limit values are summarised below.

Emission Limit Values

Emission Limit Values have been set in accordance with the values specified in Annex V Part 1 of the IED.

These 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 O₂ content of 6% for solid fuels and 3% for liquid and gaseous fuels. For this purpose, refinery fuel gas (RFG) is a gaseous fuel.

As before, in addition to emission limits set at a combustion unit level, we will continue to impose site-wide annual mass emission limits for SO₂. The MFF units will need to be fired such that, in combination with other sources of SO₂, site-wide emissions remain within the current annual mass emission limit. In this way, gains in the reduction of SO₂ to air will be maintained. This delivers our obligations to protect and improve the environment and is consistent with the principle of 'no-deterioration.'

Multifuel firing emission limits

LCP 355 (gas turbines) combustion plant covered by this decision document is multifuel fired and uses two gaseous fuels (RFG and Natural Gas). Therefore the ELVs applicable to gaseous fuels, are appropriate. Article 40(2) makes specific provision for determination of the applicable ELVs for such plant, which may be applied at the discretion of the competent authority. We recognise the differences between refinery fuels and commercial fuels, in relation to their composition and variability, which will have an impact on their associated combustion emissions, so we have decided to apply the calculation methodology provided in article 40(2) to these combustion plants, for emissions of NO_x, dust and where relevant CO.

The methodology is as follows:

(a) where, during the operation of the combustion plant, the proportion

contributed by the determinative fuel to the sum of the thermal inputs delivered by all fuels is 50% or more, the emission limit value is set in Part 1 of Annex V for the determinative fuel;

- (b) where the proportion contributed by the determinative fuel to the sum of the thermal inputs delivered by all fuels is less than 50 %, the emission limit value is determined in accordance with the following steps:
- (i) *taking the emission limit values set out in Part 1 of Annex V for each of the fuels used, corresponding to the total rated thermal input of the combustion plant;*
 - (ii) *calculating the emission limit value of the determinative fuel by multiplying the emission limit value, determined for that fuel according to point (i), by a factor of two, and subtracting from this product the emission limit value of the fuel used with the lowest emission limit value as set out in Part 1 of Annex V, corresponding to the total rated thermal input of the combustion plant;*
 - (iii) *determining the fuel-weighted emission limit value for each fuel used by multiplying the emission limit value determined under points (i) and (ii) by the thermal input of the fuel concerned and by dividing the product of this multiplication by the sum of the thermal inputs delivered by all fuels;*
 - (iv) *aggregating the fuel-weighted emission limit values determined under point (iii).*

The determinative fuel is; the fuel with the highest ELV set out in Part 1 of Annex V, or where 2 fuels both have the highest ELV, whichever has the highest thermal input.

When calculating the applicable ELVs for the MFF units, we have taken into account the following:

- The proportion of natural gas in the gaseous fuel mix never exceeds 50%. The remainder is made up from process gases such as refinery fuel gas, recovered flare gas and distillation off-gases.

Compliance with Emission Limit Values:

Part 3 of Annex V requires that SO₂, NO_x, dust and CO are monitored continuously for combustion plants with a rated thermal input of >100MW
Part 4 of Annex V specifies the compliance criteria for emissions measured continuously as follows:

- (a) *no validated monthly average value exceeds the relevant emission limit values set out in Parts 1 and 2;*
- (b) *no validated daily average value exceeds 110% of the relevant emission limit values set out in Parts 1 and 2;*
- (c) *in cases of combustion plants composed only of boilers using coal with a total rated thermal input below 50MW, no validated daily average value exceeds 150%*

of the relevant emission limit values set out in Parts 1 and 2,

- (d) 95% of all the validated hourly average values over the year do not exceed 200% of the relevant emission limit values set out in Parts 1 and 2.

Points (a),(b) & (d) are reflected in the emission limit value set for the relevant reference period (see table below). Point (c) is not relevant to any of the combustion plants covered by this decision document.

The table below summarises the emission limits and monitoring requirements for each LCP, making reference to relevant sections of Annex V of the IED and pertinent technical characteristics. Where existing, tighter ELVs are already in place, these have been carried forward into this variation, to ensure no deterioration in environmental performance.

Total Lindsey Oil Refinery Limited adapted plant mid 2016 (Future In Total - FIT project) and therefore Table S3.1 reflects the current plant configuration post the FIT project.

The changes made following the FIT project are;

- LCP 359 stack ceased to operate,
- LCP 359 furnace 23F-1 has been routed to South stack (LCP 356) and all LCP furnaces that used to go to South Stack have ceased operation, making the LCP capacity of South Stack <100MW.

Emission Point	Parameter	Existing ELV	IED Annex V relevant section	New ELV and reference period	Monitoring
A1 (LCP 356)	NOx	No limit set, releases controlled under the NERP	Part 1 (4) Note 1 and Part 1 (6) Note 4	300 mg/m ³	Periodic – at least every 6 months
	Dust	No limit set, releases controlled under the NERP	Part 1 (7) Note 1 and Part 8	5 mg/m ³	
	SO ₂	No limit set, releases controlled under the NERP	Part 1	35 mg/m ³	
A2 (LCP 357)	NOx	No limit set, releases	Part 1 (4) Note 1 and Part 1 (6)	300 mg/m ³ - calendar monthly mean of validated hourly averages	CEMS

Emission Point	Parameter	Existing ELV	IED Annex V relevant section	New ELV and reference period	Monitoring
		controlled under the NERP	Note 4	330 mg/m ³ - daily mean of validated hourly average	
				600 mg/m ³ - 95% of validated hourly averages within a calendar year	
	SO ₂	No limit set, releases controlled under the NERP	Part 1	35 mg/m ³ - calendar monthly mean of validated hourly averages	
				38.5 mg/m ³ - daily mean of validated hourly average	
			70 mg/m ³ - 95% of validated hourly averages within a calendar year		
	Dust	No limit set, releases controlled under the NERP	Part 1 (7) Note 1 and Part 8	5 mg/m ³	Periodic – at least every 6 months
A3 (LCP 358)	NOx	No limit set, releases controlled under the NERP	Part 1 (4) Note 1 and Part 1 (6) Note 4	300 mg/m ³ - calendar monthly mean of validated hourly averages	CEMS
				330 mg/m ³ - daily mean of validated hourly average	
				600 mg/m ³ - 95% of validated hourly averages within a calendar year	
	SO ₂	No limit set, releases controlled under the NERP	Part 1	35 mg/m ³ - calendar monthly mean of validated hourly averages	
				38.5 mg/m ³ - daily mean of validated hourly averages	
				70 mg/m ³ - 95% of validated hourly averages within a calendar year	
	Dust	No limit set, releases controlled under the NERP	Part 1 (7) Note 1 and Part 8	5 mg/m ³	Periodic – at least every 6 months
A6 (LCP 355)	NOx (RFG and Natural)		Part 1 (4) Note 1 and Part 1 (6)	50 – 120 mg/m ³ - calendar monthly mean of validated hourly	CEMS

Emission Point	Parameter	Existing ELV	IED Annex V relevant section	New ELV and reference period	Monitoring
	Gas firing)		Note 4	averages	
				55 – 132 mg/m ³ - daily mean of validated hourly averages	
				100 – 240 mg/m ³ - 95% of validated hourly averages within a calendar year	
	NOx (100% Natural Gas firing only)	No limits set	Part 1 (4) Note 1 and Part 1 (6) Note 4	50 mg/m ³ - calendar monthly mean of validated hourly averages	
				55 mg/m ³ - daily mean of validated hourly averages	
				100 mg/m ³ - 95% of validated hourly averages within a calendar year	
	Dust (RFG and Natural Gas firing)	No limits set	Part 1 (7) Note 1 and Part 8	-	
	CO	No limits set	Part 1	100 mg/m ³ - calendar monthly mean of validated hourly averages	
				110 mg/m ³ - daily mean of validated hourly averages	
				200 mg/m ³ - 95% of validated hourly averages within a calendar year	
A6a (LCP 355) Auxillary firing waste heat boiler	NOx (100% RFG firing only)		Part 1 (4) Note 1 and Part 1 (6) Note 4	120 mg/m ³ - calendar monthly mean of validated hourly averages	
				132 mg/m ³ - daily mean of validated hourly averages	
				240 mg/m ³ - 95% of validated hourly averages within a calendar year	
	CO (100% RFG firing only)			No limit set but requirement to monitor continuously	

Monitoring & standards

Standards for assessment of the monitoring location and for measurement of oxygen have been added to the permit template for clarity.

Continuous Emissions Monitoring (CEMs)

In their response to the Regulation 60 Notice LOR are unable to immediately comply with the full requirements for CEMs. To this effect we have issued a Regulatory Position Statement (RPS) allowing LOR time to comply. The RPS is detailed in Annex 1.

Reporting

Tables S4.3 and S4.4 have been updated to include the reporting requirements and associated reporting forms to meet the requirements of the IED chapter III.

ANNEX 1:

Copy of Regulatory Position Statement RPS/EPR/TP3633NH/V003 01/02/17.

Regulatory Position Statement RPS/EPR/TP3633NH/V003 01/02/17

Industrial Emissions Directive, Chapter III non-compliance

The Environment Agency agrees not to enforce the Industrial Emissions Directive (IED) Chapter III sulphur dioxide (SO₂), oxides of nitrogen (NO_x) and carbon monoxide (CO) monitoring requirements specified below, in relation to the permit specified below, provided the operator responsible for the permit complies with the requirements listed below.

Background

In order to implement IED Chapter III, which relates to large combustion plants (LCPs), we have reviewed permits with LCPs and varied the permit to include Chapter III compliant conditions and emission limit values (ELVs) where appropriate. Operators have informed us of their intended compliance route via their response to a Regulation 60 Notice for Information. It is apparent from the responses to these Notices that not all sites are able to immediately comply with the full requirements. As the Competent Authority we are required to issue Chapter III compliant permits and there is no provision to derogate from these conditions; however, in particular circumstances we can apply regulatory discretion, when enforcing these conditions to allow the operator reasonable opportunity to comply. We record such decisions in a regulatory position statement.

Environment Agency regulatory position statement

The Environment Agency agrees not to take enforcement action in relation to the permit conditions specified below, provided the operator complies with the requirements specified in each case.

Any enforcement action taken by the Environment Agency will be in accordance with its Enforcement and Sanctions Guidance which can be found at:
<https://www.gov.uk/government/publications/environment-agency-enforcement-and-sanctions-statement>

Activities covered by this Regulatory Position Statement

Operator and location: Total Lindsey Oil Refinery Limited, Total Lindsey Oil Refinery

Permit Variation number: EPR/TP3633NH/V003

Relevant provision of the IED

IED Chapter III: Article 38, Annex V, Part 3, paragraphs 1 and 2 -

The concentrations of SO₂, NO_x and dust in waste gases from each combustion plant with a total rated thermal input of 100 MW or more shall be measured continuously.

The concentration of CO in waste gases from each combustion plant firing gaseous fuels with a total rated thermal input of 100 MW or more shall be measured continuously.

Relevant permit conditions

Condition 3.6 and Table S3.1.

Background to RPS:

The provisions for monitoring sulphur dioxide and oxides of nitrogen emissions from LCP 357 [being a combustion plant with a total rated thermal input greater than 100MW] do not currently comply with the requirements of Annex V Part 3, paragraph 1 of the IED, in that there are no continuous SO₂ and NO_x monitors currently installed. However, the installation of continuous emissions monitors (CEMs) is scheduled for completion in May 2017.

The provisions for monitoring carbon monoxide emissions from LCP 357 and LCP 358 [being combustion plants with a total rated thermal input greater than 100MW] do not currently comply with the requirements of Annex V Part 3, paragraph 2 of the IED, in that there are no continuous CO monitors currently installed. However, the installation of continuous emissions monitors (CEMs) is scheduled for phased completion by July 2021.

Requirements of the RPS:

- The operator shall install continuous emissions monitors (CEMs) to measure SO₂, NO_x and CO emissions from LCP 357 by 1st June 2017.
- The operator shall install continuous emissions monitors (CEMs) to measure CO emissions from LCP 358 by 1st July 2021.
- The operator shall produce an implementation plan for specifying, procuring and installing the CEMs.
- The operator shall provide a written 6 monthly update on progress against the plan and shall notify the EA, as soon as practicable, of any deviation from the plan.
- On completion of installation and commissioning of the CEMs the operator shall write to the EA to confirm that their CO monitoring provisions are now compliant with the IED and that the RPS is no longer required.