

Environment Agency

Review of an Environmental Permit for an Installation subject to Chapter II of the Industrial Emissions Directive 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/UP3333LL
The Operator is: National Grid Gas Plc
The Installation is: Hatton Compressor Station
This Variation Notice number is: EPR/UP3333LL/V005

What this document is about

Article 21(3) of the Industrial Emissions Directive (IED) requires the Environment Agency to review conditions in permits that it has issued and to ensure that the permit delivers compliance with relevant standards, within four years of the publication of updated decisions on best available techniques (BAT) conclusions.

We have reviewed the permit for this installation against the revised BAT Conclusions for large combustion plant published on 17th August 2017. This is our decision document, which explains the reasoning for the consolidated variation notice that we are issuing.

It explains how we have reviewed and considered the techniques used by the Operator in the operation and control of the plant and activities of the installation. This review has been undertaken with reference to the decision made by the European Commission establishing best available techniques (BAT) conclusions ('BAT Conclusions') for large combustion plant as detailed in document reference IEDC-7-1. 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 considering the review of the operating techniques used by the Operator for the operation of the plant and activities 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 issued. It also modernises the entire permit to reflect the conditions contained in our current generic permit template.

The introduction of new template conditions makes the Permit consistent with our current general approach and philosophy and with other permits issued to installations in this sector. Although the wording of some conditions has changed, while others have been removed because of the new regulatory approach, it does not reduce the level of environmental protection achieved by the Permit in any way. In this document we therefore address only our determination of substantive issues relating to the new BAT Conclusions.

Throughout this document we will use a number of expressions. These are as referred to in the glossary and have the same meaning as described in “Schedule 6 Interpretation” of the Permit.

We try to explain our decision as accurately, comprehensively and plainly as possible. We would welcome any feedback as to how we might improve our decision documents in future. A lot of technical terms and acronyms are inevitable in a document of this nature: we provide a glossary of acronyms near the front of the document, for ease of reference.

How this document is structured

Glossary of terms

- 1 Our decision
- 2 How we reached our decision
- 2.1 Requesting information to demonstrate compliance with BAT Conclusions for Large Combustion Plant
- 2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document
- 2.3 Summary of how we considered the responses from public consultation.
- 3 The legal framework
- 4 Key Issues
- 5 Decision checklist regarding relevant BAT Conclusions
- 6 Review and assessment of derogation requests made by the operator in relation to BAT Conclusions which include an associated emission level (AEL) value
- 7 Emissions to Water
- 8 Additional IED Chapter II requirements
- 9 Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

Glossary of acronyms used in this document

(Please note that this glossary is standard for our decision documents and therefore not all these acronyms are necessarily used in this document.)

APC	Air Pollution Control
BAT	Best Available Technique(s)
BAT-AEEL	BAT Associated Energy Efficiency Level
BAT-AEL	BAT Associated Emission Level
BATc	BAT conclusion
BREF	Best available techniques reference document
CCGT	Combined Cycle Gas Turbine
CEM	Continuous emissions monitor
CHP	Combined heat and power
CV	Calorific value
DAA	Directly associated activity – Additional activities necessary to be carried out to allow the principal activity to be carried out
DLN	Dry Low NOx burners
DLN-E	Dry Low NOx effective
EIONET	European environment information and observation network is a partnership network of the European Environment Agency
ELV	Emission limit value derived under BAT or an emission limit value set out in IED
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016 (SI 2016 No. 1154)
EWC	European waste catalogue
FSA	Food Standards Agency
IC	Improvement Condition
IED	Industrial Emissions Directive (2010/75/EU)
IPPCD	Integrated Pollution Prevention and Control Directive (2008/1/EC) – now superseded by IED
LCP	Large Combustion Plant subject to Chapter III of IED
MSUL/MSDL	Minimum start up load/minimum shut-down load
NOx	Oxides of nitrogen (NO plus NO ₂ expressed as NO ₂)
NPV	Net Present Value
OCGT	Open Cycle Gas Turbine
PHE	Public Health England
SAC	Special Area of Conservation
SGN	Sector guidance note
TGN	Technical guidance note
TOC	Total Organic Carbon
WFD	Water Framework Directive (2000/60/EC)

1 Our decision

We have decided to issue the consolidated 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 many conditions 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 to demonstrate compliance with BAT Conclusions for Large Combustion Plant

We issued a Notice under Regulation 61(1) of the Environmental Permitting (England and Wales) Regulations 2016 (a Regulation 61 Notice) on 1st May 2018 requiring the Operator to provide information to demonstrate how the operation of their installation currently meets, or will subsequently meet, the revised standards described in the large combustion plant BAT Conclusions document. The Notice also required that where the revised standards are not currently met, the operator should provide information that:

- Describes the techniques that will be implemented before 17th August 2021, which will then ensure that operations meet the revised standard, or
- Justifies why standards will not be met by 17th August 2021, and confirmation of the date when the operation of those processes will cease within the installation or an explanation of why the revised BAT standard is not applicable to those processes, or
- Justifies why an alternative technique will achieve the same level of environmental protection equivalent to the revised standard described in the BAT Conclusions.

Where the Operator proposed that they were not intending to meet a BAT standard that also included a BAT Associated Emission Level (BAT AEL) described in the BAT Conclusions Document, the Regulation 61 Notice requested that the Operator make a formal request for derogation from compliance with that AEL (as provisioned by Article 15(4) of IED). In this circumstance, the Notice identified that any such request for derogation must be supported and justified by sufficient technical and commercial information that would enable us to determine acceptability of the derogation request.

The Regulation 61 Notice response from the Operator was received on 30 November 2018.

We considered it was in the correct form and contained sufficient information for us to begin our determination of the permit review but not that it necessarily contained all the information we would need to complete that review.

2.2 Review of our own information in respect to the capability of the installation to meet revised standards included in the BAT Conclusions document

Based on our records and previous regulatory activities with the facility we have no reason to consider that the operator will not be able to comply with the conditions that we include in the permit.

3 The legal framework

The consolidated variation notice will be issued under Regulation 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 the consolidated variation notice 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.

4 The key issues

The key issues arising during this permit review are:

- Emissions to air and the emission limits applied to the plant.
- The energy efficiency levels associated with the Best Available Techniques (BAT-AEELs)
- The review and assessment of the availability of BAT for gas turbines operating <500 hours per year

We therefore describe how we determined these issues in most detail in the relevant sections of this document.

4.1 Emissions to air and the emission limits applied to the plant

A number of general principles were applied during the permit review. These included:

- The upper value of the BAT AELs ranges specified were used unless use of the tighter limit was justified.
- The principle of no backsliding where if existing limits in the permit were already tighter than those specified in the BREF, the existing permit limits were retained.
- Where a limit was specified in both IED Annex V and the BAT Conclusions for a particular reference period, the tighter limit was applied and in the majority of cases this was from the BAT Conclusions.
- Where AELs are indicative in the BAT Conclusions, these were applied unless adequate justification was provided by the operator to demonstrate that an alternative limit was more appropriate.

The LCP(s) on site consist of:

- LCP 238 (Unit A): This LCP consists of a 66.5 MWth OCGT which vents via emission point A1. The unit burns natural gas only.
- LCP 239 (Unit B): This LCP consists of a 64.7 MWth OCGT which vents via emission point A2. The unit burns natural gas only.
- LCP 240 (Unit C): This LCP consists of a 64.9 MWth OCGT which vents via emission point A3. The unit burns natural gas only.

The plant was put into operation before IED came into force and therefore the existing limits in the permit are from Part 1 of IED Annex V applicable to existing plant.

The ELVs and AELs are based on the following operating regime:

- LCP 238: <500 hours emergency only plant
- LCP 239: Limited Life Derogation under IED until December 2023
- LCP 240: Limited Life Derogation under IED until December 2023

LCP 238:

LCP 238 is a gas turbine operated for Mechanical Drive, which is limited to less than 500 hours per year, therefore there are no applicable BAT-AELs.

LCP 239 and LCP 240:

In 2015, the Operator chose to operate these LCPs under a Limited Life Derogation (LLD) as described in Article 33(1)(a) of the Industrial Emissions Directive 2010/75/EU. This means the gas turbine will not be operated for more than 17,500 hours, starting from 1 January 2016 and ending no later than 31 December 2023.

Operators of combustion plants that have opted for the LLD do not have to comply with the BATcs applicable to the air pollutants that are subject to the LLD. Therefore the current emission limits will be retained and we have not set any additional or revised emission limits for these LCPs as part of this review. All other provisions of the BATcs do apply (for example energy efficiency and monitoring requirements).

4.2 The energy efficiency levels associated with the Best Available Techniques Conclusions

An energy efficiency level associated with the best available techniques (BAT-AEEL) refers to the ratio between the combustion unit's net energy output(s) and the combustion unit's fuel/feedstock energy input at actual unit design. The net energy output(s) is determined at the combustion unit boundaries, including auxiliary systems (e.g. flue-gas treatment systems), and for the unit operated at full load.

For LCP 238, Table 23 of the LCP BAT Conclusions specifies that the BAT-AEELs for this type of plant are not applicable to plant operating less than 1500 hours per year. We have therefore not assessed this operational aspect of the plant. We have however included a process monitoring requirement in table S3.3 of the consolidated variation notice. This is required to demonstrate that efficiency levels are maintained following any significant overhauls of equipment in order to fulfil the requirement of BAT Conclusion 2. For <500 hour plant we have specified that the assessment of efficiency can be based on calculation. This is because we will not require plant to fire up with the sole purpose of carrying out an assessment of efficiency.

For LCP 239 and LCP 240, the table below sets out the BAT-AEELs specified in the LCP BAT Conclusions for the large combustion plant on the site and the energy efficiency levels confirmed through the Regulation 61 notice response. The Operator confirmed that the original equipment manufacturer provided a calculation based on their internal product data for the equipment installed in order to determine the net mechanical efficiency.

BAT AEELs (%)			Plant efficiency (%)		
Net electrical efficiency	Net total fuel utilisation	Net mechanical efficiency	Net electrical efficiency	Net total fuel utilisation	Net mechanical efficiency
LCP 239: Open cycle gas turbine, ≥ 50 MWth, Existing unit, Mechanical Drive					
None	None	33.5-41	NA	NA	33.3
LCP 240: Open cycle gas turbine, ≥ 50 MWth, Existing unit, Mechanical Drive					
None	None	33.5-41	NA	NA	33.3

LCP 239 and LCP 240 do not meet the BAT-AEEL range for this type of plant. However, they are operated under a Limited Life Derogation (LLD) as described in Article 33(1)(a) of the Industrial Emissions Directive 2010/75/EU. This means that the Operator has agreed that the plant will not operate past 31 December 2023. We are therefore satisfied that it would not be cost effective for any upgrades to this plant and that the current net mechanical efficiency is BAT.

A formal derogation is not required from the BAT-AEELs under Article 15(4) where it is proven that alternative values can be regarded as BAT. If the operator intends to continue operation after 31 December 2023 they will require a permit variation to allow further operation and the requirements of these BATcs will apply.

4.3 The review and assessment of BAT for gas turbines operating <500 hours per year

Joint Environmental Programme (JEP) produced a document ‘BAT Assessment for Existing Gas and Liquid Fuel Fired OCGTs, CCGTs and Dual-fuel GTs with a Thermal Input Rating of 50MWth or Greater Operating <500 Hours Per Year’ dated October 2018. The content of this document has been agreed in principle by the Environment Agency and we have therefore taken the document into account during our determination of this variation.

The JEP document states that plants operated for emergency use will have very low running hours, comprising testing of critical systems and operation during site emergencies only. As such, emissions will be limited and abatement techniques are unlikely to be cost-effective.

We agree that the techniques reported under BAT conclusion 42 are not applicable to LCP 238.

In all cases, the minimum BAT requirements are considered to be: i) the continued compliance with any permit requirements already in place to protect air quality and ii) the demonstration of an appropriate maintenance regime to maintain plant emissions performance.

5 Decision checklist regarding relevant BAT Conclusions

BAT Conclusions for large combustion plant, were published by the European Commission on 17th August 2017. There are 75 BAT Conclusions. Only the BAT Conclusions relevant to the particular fuel type used on site have been replicated below.

This annex provides a record of decisions made in relation to each relevant BAT Conclusion applicable to the installation. This annex should be read in conjunction with the Consolidated Variation Notice.

The conditions in the permit through which the relevant BAT Conclusions are implemented include but are not limited to the following:

BAT Conclusion requirement topic	Permit condition(s)	Permit table(s)
Environmental Management System	1.1.1	S1.2
BAT AELs	N/A	N/A
Monitoring	2.3, 3.5 and 3.6	S1.2, S1.4
Energy efficiency	1.2 and 2.3	S3.3
Noise	3.4 and 2.3	S1.2
Other operating techniques	2.3	S1.2

The overall status of compliance with the BAT conclusion is indicated in the table as:

- NA Not Applicable
- CC Currently Compliant
- FC Compliant in the future (within 4 years of publication of BAT conclusions)
- NC Not Compliant
- PC Partially Compliant

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
General			
1	<p>In order to improve the overall environmental performance, BAT is to implement and adhere to an environmental management system (EMS) that incorporates all of the following features:</p> <ul style="list-style-type: none"> i. commitment of the management, including senior management; ii. definition of an environmental policy that includes the continuous improvement of the installation by the management; iii. planning and establishing the necessary procedures, objectives and targets, in conjunction with financial planning and investment; iv. implementation of procedures <ul style="list-style-type: none"> (a) Structure and responsibility (b) Training (c) Communication (d) Employee involvement (e) Documentation (f) Efficient process control (g) Maintenance programmes (h) Emergency preparedness and response (i) Safeguarding compliance with environmental legislation v. checking performance and taking corrective action, paying particular attention to: <ul style="list-style-type: none"> (a) monitoring and measurement (see also the Reference Document on the General Principles of Monitoring) (b) corrective and preventive action (c) maintenance of records (d) independent (where practicable) internal and external auditing in order to determine whether or not the EMS conforms to planned arrangements and has been properly implemented and maintained; vi. review of the EMS and its continuing suitability, adequacy and effectiveness by senior management; vii. following the development of cleaner technologies; viii. consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life; viii. consideration for the environmental impacts from the eventual decommissioning of the installation at the stage of designing a new plant, and throughout its operating life; ix. application of sectoral benchmarking on a regular basis. <p>Etc - see BAT Conclusions</p>	CC	<p>National Grid operates an ISO14001 certified EMS.</p> <p>The operator has confirmed that National Grid Plc operates a corporate EMS for all it's business units. National Grid Gas (Gas Transmission) has management procedures of its own to implement the requirements of the corporate EMS which are common to all installations. Each installation has its own site specific aspects and impacts register.</p>

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement													
	<p>Applicability. The scope (e.g. level of detail) and nature of the EMS (e.g. standardised or non-standardised) will generally be related to the nature, scale and complexity of the installation, and the range of environmental impacts it may have.</p>															
2	<p>BAT is to determine the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the gasification, IGCC and/or combustion units by carrying out a performance test at full load (1), according to EN standards, after the commissioning of the unit and after each modification that could significantly affect the net electrical efficiency and/or the net total fuel utilisation and/or the net mechanical energy efficiency of the unit. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p>	CC	<p>The net mechanical efficiency of LCP 239 and LCP 240 is 33.3%. This is based on product data from the original equipment manufacturer. We consider this plant is BAT in relation to the AEELs. See Section 4.2 of this decision document for further information.</p> <p>For LCP 238, the BAT-AEELs are not applicable to plant operating <1500 hours.</p> <p>A process monitoring requirement has been set in table S3.3 which requires energy efficiency monitoring after an overhaul.</p>													
3	<p>BAT is to monitor key process parameters relevant for emissions to air and water including those given below.</p> <table border="1" data-bbox="322 1110 1491 1283"> <thead> <tr> <th data-bbox="322 1110 687 1145">Stream</th> <th data-bbox="687 1110 1122 1145">Parameter(s)</th> <th data-bbox="1122 1110 1491 1145">Monitoring</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1145 687 1251" rowspan="3">Flue-gas</td> <td data-bbox="687 1145 1122 1177">Flow</td> <td data-bbox="1122 1145 1491 1177">Periodic or continuous determination</td> </tr> <tr> <td data-bbox="687 1177 1122 1214">Oxygen content, temperature, and pressure</td> <td data-bbox="1122 1177 1491 1214">Periodic or continuous measurement</td> </tr> <tr> <td data-bbox="687 1214 1122 1251">Water vapour content⁽¹⁾</td> <td data-bbox="1122 1214 1491 1251"></td> </tr> <tr> <td data-bbox="322 1251 687 1283">Waste water from flue-gas treatment</td> <td data-bbox="687 1251 1122 1283">Flow, pH, and temperature</td> <td data-bbox="1122 1251 1491 1283">Continuous measurement</td> </tr> </tbody> </table>	Stream	Parameter(s)	Monitoring	Flue-gas	Flow	Periodic or continuous determination	Oxygen content, temperature, and pressure	Periodic or continuous measurement	Water vapour content ⁽¹⁾		Waste water from flue-gas treatment	Flow, pH, and temperature	Continuous measurement	CC	<p>Flow - Fuel gas usage is measured and flue-gas flow is determined by stoichiometric calculations.</p> <p>Oxygen content, temperature and pressure - NOx, carbon monoxide (CO) and Oxygen (O₂) concentration content is measured via periodic measurements, conducted by UKAS ISO17025 laboratory to EN standards.</p>
Stream	Parameter(s)	Monitoring														
Flue-gas	Flow	Periodic or continuous determination														
	Oxygen content, temperature, and pressure	Periodic or continuous measurement														
	Water vapour content ⁽¹⁾															
Waste water from flue-gas treatment	Flow, pH, and temperature	Continuous measurement														

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																		
			<p>Emissions measurements taken in this way are not affected by changes in temperature and pressure and these parameters are not required for correction to reference conditions. We are satisfied with the Operators justification of why temperature and pressure are not measured.</p> <p>Water vapour content - Flue gas is dried prior to measurement for periodic monitoring.</p> <p>Waste water from flue-gas treatment - no waste water is generated from flue-gas treatment.</p>																		
4	<p>BAT is to monitor emissions to air with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p> <table border="1" data-bbox="322 954 1491 1385"> <thead> <tr> <th data-bbox="322 954 474 1074">Substance/Parameter</th> <th data-bbox="474 954 790 1074">Fuel/Process/Type of combustion plant</th> <th data-bbox="790 954 947 1074">Combustion plant total rated thermal input</th> <th data-bbox="947 954 1126 1074">Standard(s)⁽⁴⁾</th> <th data-bbox="1126 954 1346 1074">Minimum monitoring frequency⁽⁵⁾</th> <th data-bbox="1346 954 1491 1074">Monitoring associated with</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1074 474 1139">NH₃</td> <td data-bbox="474 1074 790 1139">— When SCR and/or SNCR is used</td> <td data-bbox="790 1074 947 1139">All sizes</td> <td data-bbox="947 1074 1126 1139">Generic EN standards</td> <td data-bbox="1126 1074 1346 1139">Continuous⁽⁶⁾⁽⁷⁾</td> <td data-bbox="1346 1074 1491 1139">BAT 7</td> </tr> <tr> <td data-bbox="322 1139 474 1385">NO_x</td> <td data-bbox="474 1139 790 1385"> — Coal and/or lignite including waste co-incineration — Solid biomass and/or peat including waste co-incineration — HFO- and/or gas-oil-fired boilers and engines </td> <td data-bbox="790 1139 947 1385">All sizes</td> <td data-bbox="947 1139 1126 1385">Generic EN standards</td> <td data-bbox="1126 1139 1346 1385">Continuous⁽⁶⁾⁽⁸⁾</td> <td data-bbox="1346 1139 1491 1385"> BAT 20 BAT 24 BAT 28 BAT 32 BAT 37 BAT 41 BAT 42 BAT 43 BAT 47 BAT 48 BAT 56 </td> </tr> </tbody> </table>	Substance/Parameter	Fuel/Process/Type of combustion plant	Combustion plant total rated thermal input	Standard(s) ⁽⁴⁾	Minimum monitoring frequency ⁽⁵⁾	Monitoring associated with	NH ₃	— When SCR and/or SNCR is used	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁷⁾	BAT 7	NO _x	— Coal and/or lignite including waste co-incineration — Solid biomass and/or peat including waste co-incineration — HFO- and/or gas-oil-fired boilers and engines	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁸⁾	BAT 20 BAT 24 BAT 28 BAT 32 BAT 37 BAT 41 BAT 42 BAT 43 BAT 47 BAT 48 BAT 56	CC	<p>A Predictive Emission Monitoring System (PEMS) is used for monitoring of NO_x validated by periodic measurement. Footnote 5 to BAT 4 confirms that PEMS may be used for existing OCGTs.</p>
Substance/Parameter	Fuel/Process/Type of combustion plant	Combustion plant total rated thermal input	Standard(s) ⁽⁴⁾	Minimum monitoring frequency ⁽⁵⁾	Monitoring associated with																
NH ₃	— When SCR and/or SNCR is used	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁷⁾	BAT 7																
NO _x	— Coal and/or lignite including waste co-incineration — Solid biomass and/or peat including waste co-incineration — HFO- and/or gas-oil-fired boilers and engines	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁸⁾	BAT 20 BAT 24 BAT 28 BAT 32 BAT 37 BAT 41 BAT 42 BAT 43 BAT 47 BAT 48 BAT 56																

BAT Concn. Numbe r	Summary of BAT Conclusion requirement						Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
		<ul style="list-style-type: none"> — Gas-oil-fired gas turbines — Natural-gas-fired boilers, engines, and turbines — Iron and steel process gases — Process fuels from the chemical industry — IGCC plants 				BAT 64 BAT 65 BAT 73		
		<ul style="list-style-type: none"> — Combustion plants on offshore platforms 	All sizes	EN 14792	Once every year ⁽⁹⁾	BAT 53		
	N ₂ O	<ul style="list-style-type: none"> — Coal and/or lignite in circulating fluidised bed boilers — Solid biomass and/or peat in circulating fluidised bed boilers 	All sizes	EN 21258	Once every year ⁽¹⁰⁾	BAT 20 BAT 24		
	CO	<ul style="list-style-type: none"> — Coal and/or lignite including waste co-incineration — Solid biomass and/or peat including waste co-incineration — HFO- and/or gas-oil-fired boilers and engines — Gas-oil-fired gas turbines — Natural-gas-fired boilers, engines, and turbines — Iron and steel process gases — Process fuels from the chemical industry — IGCC plants 	All sizes	Generic EN standards	Continuous ⁽⁶⁾ ⁽⁸⁾	BAT 20 BAT 24 BAT 28 BAT 33 BAT 38 BAT 44 BAT 49 BAT 56 BAT 64 BAT 65 BAT 73		
		<ul style="list-style-type: none"> — Combustion plants on offshore platforms 	All sizes	EN 15058	Once every year ⁽⁹⁾	BAT 54		

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																																															
5	<p>BAT is to monitor emissions to water from flue-gas treatment with at least the frequency given below and in accordance with EN standards. If EN standards are not available, BAT is to use ISO, national or other international standards that ensure the provision of data of an equivalent scientific quality.</p> <table border="1" data-bbox="331 475 1491 1225"> <thead> <tr> <th colspan="2">Substance/Parameter</th> <th>Standard(s)</th> <th>Minimum monitoring frequency</th> <th>Monitoring associated with</th> </tr> </thead> <tbody> <tr> <td colspan="2">Total organic carbon (TOC)₍₂₆₎</td> <td>EN 1484</td> <td rowspan="10">Once every month</td> <td rowspan="10">BAT 15</td> </tr> <tr> <td colspan="2">Chemical oxygen demand (COD)₍₂₆₎</td> <td>No EN standard available</td> </tr> <tr> <td colspan="2">Total suspended solids (TSS)</td> <td>EN 872</td> </tr> <tr> <td colspan="2">Fluoride (F⁻)</td> <td>EN ISO 10304-1</td> </tr> <tr> <td colspan="2">Sulphate (SO₄²⁻)</td> <td>EN ISO 10304-1</td> </tr> <tr> <td colspan="2">Sulphide, easily released (S²⁻)</td> <td>No EN standard available</td> </tr> <tr> <td colspan="2">Sulphite (SO₃²⁻)</td> <td>EN ISO 10304-3</td> </tr> <tr> <td rowspan="8">Metals and metalloids</td> <td>As</td> <td rowspan="8">Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)</td> </tr> <tr> <td>Cd</td> </tr> <tr> <td>Cr</td> </tr> <tr> <td>Cu</td> </tr> <tr> <td>Ni</td> </tr> <tr> <td>Pb</td> </tr> <tr> <td>Zn</td> </tr> <tr> <td>Hg</td> <td>Various EN standards available (e.g. EN ISO 12846 or EN ISO 17852)</td> </tr> <tr> <td colspan="2">Chloride (Cl⁻)</td> <td>Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)</td> <td>—</td> </tr> <tr> <td colspan="2">Total nitrogen</td> <td>EN 12260</td> <td>—</td> </tr> </tbody> </table>	Substance/Parameter		Standard(s)	Minimum monitoring frequency	Monitoring associated with	Total organic carbon (TOC) ₍₂₆₎		EN 1484	Once every month	BAT 15	Chemical oxygen demand (COD) ₍₂₆₎		No EN standard available	Total suspended solids (TSS)		EN 872	Fluoride (F ⁻)		EN ISO 10304-1	Sulphate (SO ₄ ²⁻)		EN ISO 10304-1	Sulphide, easily released (S ²⁻)		No EN standard available	Sulphite (SO ₃ ²⁻)		EN ISO 10304-3	Metals and metalloids	As	Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)	Cd	Cr	Cu	Ni	Pb	Zn	Hg	Various EN standards available (e.g. EN ISO 12846 or EN ISO 17852)	Chloride (Cl ⁻)		Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)	—	Total nitrogen		EN 12260	—	NA	No flue-gas treatment.
Substance/Parameter		Standard(s)	Minimum monitoring frequency	Monitoring associated with																																														
Total organic carbon (TOC) ₍₂₆₎		EN 1484	Once every month	BAT 15																																														
Chemical oxygen demand (COD) ₍₂₆₎		No EN standard available																																																
Total suspended solids (TSS)		EN 872																																																
Fluoride (F ⁻)		EN ISO 10304-1																																																
Sulphate (SO ₄ ²⁻)		EN ISO 10304-1																																																
Sulphide, easily released (S ²⁻)		No EN standard available																																																
Sulphite (SO ₃ ²⁻)		EN ISO 10304-3																																																
Metals and metalloids	As	Various EN standards available (e.g. EN ISO 11885 or EN ISO 17294-2)																																																
	Cd																																																	
	Cr																																																	
	Cu																																																	
	Ni																																																	
	Pb																																																	
	Zn																																																	
	Hg		Various EN standards available (e.g. EN ISO 12846 or EN ISO 17852)																																															
Chloride (Cl ⁻)		Various EN standards available (e.g. EN ISO 10304-1 or EN ISO 15682)	—																																															
Total nitrogen		EN 12260	—																																															
6	<p>In order to improve the general environmental performance of combustion plants and to reduce emissions to air of CO and unburnt substances, BAT is to ensure optimised combustion and to use an appropriate combination of the techniques given below.</p> <table border="1" data-bbox="331 1337 1491 1375"> <thead> <tr> <th>Technique</th> <th>Description</th> <th>Applicability</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Technique	Description	Applicability				CC	Fuel blending and mixing - the plant is run on natural gas, there are no backup or start up fuels. There is no requirement to blend or mix fuels.																																									
Technique	Description	Applicability																																																

BAT Concn. Number	Summary of BAT Conclusion requirement				Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	a.	Fuel blending and mixing	Ensure stable combustion conditions and/or reduce the emission of pollutants by mixing different qualities of the same fuel type	Generally applicable		<p>Maintenance of the combustion system - National Grid operates a preventative maintenance management system which is certified to both PAS 55 and ISO 55001. The maintenance system identifies all site plant and equipment and details the frequency and requirements for the maintenance set by the manufacturer, British and international standards and input from incidents and failures.</p> <p>Advanced Control Systems – The control systems on these units are constrained by the configuration and design of the gas turbine to reduce the combustion emissions. BAT 6 states that the applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control demand system.</p> <p>LCP 238 is operating less than 500 hours/year. Therefore the Operator confirms that there are no plans to update the control system to a more advanced configuration.</p> <p>LCP239 and LCP 240 are operating under LLD and will cease operation by 31 December</p>
b.	Maintenance of the combustion system	Regular planned maintenance according to suppliers' recommendations				
c.	Advanced control system	See description in Section 8.1	The applicability to old combustion plants may be constrained by the need to retrofit the combustion system and/or control command system			
d.	Good design of the combustion equipment	Good design of furnace, combustion chambers, burners and associated devices	Generally applicable to new combustion plants			
e.	Fuel choice	Select or switch totally or partially to another fuel(s) with a better environmental profile (e.g. with low sulphur and/or mercury content) amongst the available fuels, including in start-up situations or when back-up fuels are used	Applicable within the constraints associated with the availability of suitable types of fuel with a better environmental profile as a whole, which may be impacted by the energy policy of the Member State, or by the integrated site's fuel balance in the case of combustion of industrial process fuels. For existing combustion plants, the type of fuel chosen may be limited by the configuration and the design of the plant			

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			<p>2023. Therefore the Operator confirms that there are no plans to update the control system to a more advanced configuration.</p> <p>Good design of the combustion equipment – All these units are generally more than 20 years old and of a design that maximises the combustion system.</p> <p>Fuel Choice – The plant is operated using natural gas, there are no backup or start up fuels. Natural gas quality is determined by the Gas Supply and Management Regulations (GSMR) and requires the gas to be controlled with in tight limits for quality, contents (low sulphur) and combustion characteristics.</p>
7	<p>In order to reduce emissions of ammonia to air from the use of selective catalytic reduction (SCR) and/or selective non-catalytic reduction (SNCR) for the abatement of NO_x emissions, BAT is to optimise the design and/or operation of SCR and/or SNCR (e.g. optimised reagent to NO_x ratio, homogeneous reagent distribution and optimum size of the reagent drops).</p> <p>BAT-associated emission levels</p> <p>The BAT-associated emission level (BAT-AEL) for emissions of NH₃ to air from the use of SCR and/or SNCR is < 3–10 mg/Nm³ as a yearly average or average over the sampling period. The lower end of the range can be achieved when using SCR and the upper end of the range can be achieved when using SNCR without wet abatement techniques. In the case of plants combusting biomass and operating at variable loads as well as in the case of engines combusting HFO and/or gas oil, the higher end of the BAT-AEL range is 15 mg/Nm³.</p>	NA	Not applicable - no SCR or SNCR on site.
8	In order to prevent or reduce emissions to air during normal operating conditions, BAT is to ensure, by appropriate design, operation and maintenance, that the emission abatement systems are used at optimal capacity and availability.	NA	Not applicable as there is no emission abatement systems in operation at the installation.

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement						
9	<p>In order to improve the general environmental performance of combustion and/or gasification plants and to reduce emissions to air, BAT is to include the following elements in the quality assurance/quality control programmes for all the fuels used, as part of the environmental management system (see BAT 1):</p> <ul style="list-style-type: none"> (i) Initial full characterisation of the fuel used including at least the parameters listed below and in accordance with EN standards. ISO, national or other international standards may be used provided they ensure the provision of data of an equivalent scientific quality; (ii) Regular testing of the fuel quality to check that it is consistent with the initial characterisation and according to the plant design specifications. The frequency of testing and the parameters chosen from the table below are based on the variability of the fuel and an assessment of the relevance of pollutant releases (e.g. concentration in fuel, flue-gas treatment employed); (iii) Subsequent adjustment of the plant settings as and when needed and practicable (e.g. integration of the fuel characterisation and control in the advanced control system (see description in Section 8.1)). 	CC	LCPs are fired on Natural Gas only. This gas has to meet a nationally agreed specification for all the parameters listed. We consider that for plants which burn natural gas from the National Grid as a fuel that it is not necessary for the operator to replicate the testing carried out by the National Grid						
10	<p>In order to reduce emissions to air and/or to water during other than normal operating conditions (OTNOC), BAT is to set up and implement a management plan as part of the environmental management system (see BAT 1), commensurate with the relevance of potential pollutant releases, that includes the following elements:</p> <ul style="list-style-type: none"> — appropriate design of the systems considered relevant in causing OTNOC that may have an impact on emissions to air, water and/or soil (e.g. low-load design concepts for reducing the minimum start-up and shutdown loads for stable generation in gas turbines), — set-up and implementation of a specific preventive maintenance plan for these relevant systems, — review and recording of emissions caused by OTNOC and associated circumstances and implementation of corrective actions if necessary, — periodic assessment of the overall emissions during OTNOC (e.g. frequency of events, duration, emissions quantification/estimation) and implementation of corrective actions if necessary. 	CC	The LCPs control systems monitor critical gas turbine running parameters and shut down in case of malfunction and OTNOC.						
11	<p>BAT is to appropriately monitor emissions to air and/or to water during OTNOC.</p> <p>Description</p> <p>The monitoring can be carried out by direct measurement of emissions or by monitoring of surrogate parameters if this proves to be of equal or better scientific quality than the direct measurement of emissions. Emissions during start-up and shutdown (SU/SD) may be assessed based on a detailed emission measurement carried out for a typical SU/SD procedure at least once every year, and using the results of this measurement to estimate the emissions for each and every SU/SD throughout the year.</p>	CC	The LCPs control systems monitor critical gas turbine running parameters and shut down in case of malfunction and OTNOC.						
12	<p>In order to increase the energy efficiency of combustion, gasification and/or IGCC units operated $\geq 1\,500$ h/yr, BAT is to use an appropriate combination of the techniques given below.</p> <table border="1" data-bbox="322 1353 1496 1388"> <thead> <tr> <th data-bbox="322 1353 577 1388">Technique</th> <th data-bbox="577 1353 1057 1388">Description</th> <th data-bbox="1057 1353 1496 1388">Applicability</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Technique	Description	Applicability				CC	Combustion optimisation - Single annular combustors with gas fuel.
Technique	Description	Applicability							

BAT Concn. Number	Summary of BAT Conclusion requirement				Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	a.	Combustion optimisation	See description in Section 8.2. Optimising the combustion minimises the content of unburnt substances in the flue-gases and in solid combustion residues	Generally applicable		<p>Optimisation of the working medium conditions - Operation of compressor units are aimed to be at optimum efficiency with the constraints of the system and supply/demand gas patterns, all medium used is pre-defined in the Gas Safety management Regulations (GSMR).</p> <p>Minimisation of energy consumption - Gas turbine, Power Turbine, and Gas Compressor are sized and optimised for the duty required.</p> <p>Pre-heating of combustion air - Only used where anti-icing techniques are employed at low ambient temperatures.</p> <p>Fuel pre-heating - preheating by water bath heater</p> <p>Advanced control system - Controlled by a governor valve which is controlled and monitored by programmable logic controllers (PLC).</p> <p>LCP 238 – BATc 12 is not applicable to plant which operates less than 1500 hours per year.</p>
b.	Optimisation of the working medium conditions	Operate at the highest possible pressure and temperature of the working medium gas or steam, within the constraints associated with, for example, the control of NO _x emissions or the characteristics of energy demanded				
c.	Optimisation of the steam cycle	Operate with lower turbine exhaust pressure by utilisation of the lowest possible temperature of the condenser cooling water, within the design conditions				
d.	Minimisation of energy consumption	Minimising the internal energy consumption (e.g. greater efficiency of the feed-water pump)				
e.	Preheating of combustion air	Reuse of part of the heat recovered from the combustion flue-gas to preheat the air used in combustion	Generally applicable within the constraints related to the need to control NO _x emissions			
f.	Fuel preheating	Preheating of fuel using recovered heat	Generally applicable within the constraints associated with the boiler design and the need to control NO _x emissions			
g.	Advanced control system	See description in Section 8.2. Computerised control of the main combustion parameters enables the combustion efficiency to be improved	Generally applicable to new units. The applicability to old units may be constrained by the need to retrofit the combustion system and/or control command system			
h.	Feed-water preheating using recovered heat	Preheat water coming out of the steam condenser with recovered heat, before reusing it in the boiler	Only applicable to steam circuits and not to hot boilers. Applicability to existing units may be limited due to constraints associated with the plant configuration and the amount of recoverable heat			
i.	Heat recovery by cogeneration (CHP)	Recovery of heat (mainly from the steam system) for producing hot water/steam to be used in industrial processes/activities or in a public network for district heating. Additional heat recovery is possible from:	Applicable within the constraints associated with the local heat and power demand. The applicability may be limited in the case of gas compressors with an unpredictable operational heat profile			

BAT Concn. Number	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			<ul style="list-style-type: none"> — flue-gas — grate cooling — circulating fluidised bed 		
j.	CHP readiness	See description in Section 8.2.		Only applicable to new units where there is a realistic potential for the future use of heat in the vicinity of the unit	
k.	Flue-gas condenser	See description in Section 8.2.		Generally applicable to CHP units provided there is enough demand for low-temperature heat	
l.	Heat accumulation	Heat accumulation storage in CHP mode		Only applicable to CHP plants. The applicability may be limited in the case of low heat load demand	
m.	Wet stack	See description in Section 8.2.		Generally applicable to new and existing units fitted with wet FGD	
n.	Cooling tower discharge	The release of emissions to air through a cooling tower and not via a dedicated stack		Only applicable to units fitted with wet FGD where reheating of the flue-gas is necessary before release, and where the unit cooling system is a cooling tower	
o.	Fuel pre-drying	The reduction of fuel moisture content before combustion to improve combustion conditions		Applicable to the combustion of biomass and/or peat within the constraints associated with spontaneous combustion risks (e.g. the moisture content of peat is kept above 40 % throughout the delivery chain). The retrofit of existing plants may be restricted by the extra calorific value that can be obtained from the drying operation and by the limited retrofit possibilities offered by some boiler designs or plant configurations	
p.	Minimisation of heat losses	Minimising residual heat losses, e.g. those that occur via the slag or those that can be reduced by insulating radiating sources		Only applicable to solid-fuel-fired combustion units and to gasification/IGCC units	
q.	Advanced materials	Use of advanced materials proven to be capable of withstanding high operating temperatures and pressures and thus to achieve increased steam/combustion process efficiencies		Only applicable to new plants	

BAT Concn. Number	Summary of BAT Conclusion requirement				Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	r.	Steam turbine upgrades	This includes techniques such as increasing the temperature and pressure of medium-pressure steam, addition of a low-pressure turbine, and modifications to the geometry of the turbine rotor blades	The applicability may be restricted by demand, steam conditions and/or limited plant lifetime		
	s.	Supercritical and ultra-supercritical steam conditions	Use of a steam circuit, including steam reheating systems, in which steam can reach pressures above 220,6 bar and temperatures above 374 °C in the case of supercritical conditions, and above 250 – 300 bar and temperatures above 580 – 600 °C in the case of ultra-supercritical conditions	Only applicable to new units of $\geq 600 \text{ MW}_{\text{th}}$ operated $> 4\,000 \text{ h/yr}$. Not applicable when the purpose of the unit is to produce low steam temperatures and/or pressures in process industries. Not applicable to gas turbines and engines generating steam in CHP mode. For units combusting biomass, the applicability may be constrained by high-temperature corrosion in the case of certain biomasses		
13	In order to reduce water usage and the volume of contaminated waste water discharged, BAT is to use one or both of the techniques given in BAT 13.				NA	Water is not used in the process of gas turbine driven mechanical drive gas compression in operation at the installation.
14	<p>In order to prevent the contamination of uncontaminated waste water and to reduce emissions to water, BAT is to segregate waste water streams and to treat them separately, depending on the pollutant content.</p> <p>Description Waste water streams that are typically segregated and treated include surface run-off water, cooling water, and waste water from flue-gas treatment.</p> <p>Applicability The applicability may be restricted in the case of existing plants due to the configuration of the drainage systems.</p>				CC	<p>Water is not used in the process and there is no direct water based effluent from the operation of the gas turbines on site.</p> <p>A small amount of water (20 to 50 litres) is used with detergent to complete a "wash" of the gas turbine, to clean out combustion and airborne debris from the engine internals. This is done on a monitored condition basis, the more hours the unit is running, the greater the frequency of washing required. All of the water used to complete washing is</p>

BAT Concn. Numbe r	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			<p>contaminated, thus is collected, segregated and disposed of as hazardous waste.</p> <p>There are no discharges to sewer from the installation. Domestic discharges from the facilities in the control building are directed to a bio-disc for treatment. The contents of the bio-disc are pumped out, by a third-party contractor, on a regular basis.</p> <p>As no process effluent is discharged from emission point W1, only limited primary treatment is required prior to discharge. All surface water and treated water from the bio-disc passes through the installation's main interceptor to remove any residual oil collected from site run-off, prior to being discharged to W1.</p> <p>A programme of visual inspection of the discharge, for oil and grease, is in place to ensure efficiency of the oil interceptor.</p>
15	In order to reduce emissions to water from flue-gas treatment, BAT is to use an appropriate combination of the techniques given in BAT 15, and to use secondary techniques as close as possible to the source in order to avoid dilution.	NA	Not applicable as no emissions to water from flue-gas treatment
16	In order to reduce the quantity of waste sent for disposal from the combustion and/or gasification process and abatement techniques, BAT is to organise operations so as to maximise, in order of priority and taking into account life-cycle thinking:	CC	There is no waste generated from combustion process and no abatement systems in operation at the installation.

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement															
	<p>(a) waste prevention, e.g. maximise the proportion of residues which arise as by-products;</p> <p>(b) waste preparation for reuse, e.g. according to the specific requested quality criteria;</p> <p>(c) waste recycling;</p> <p>(d) other waste recovery (e.g. energy recovery),</p> <p>by implementing an appropriate combination of techniques such as:</p> <table border="1" data-bbox="322 571 1491 1161"> <thead> <tr> <th data-bbox="322 571 573 608">Technique</th> <th data-bbox="573 571 1079 608">Description</th> <th data-bbox="1079 571 1491 608">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 608 573 762">a. Generation of gypsum as a by-product</td> <td data-bbox="573 608 1079 762">Quality optimisation of the calcium-based reaction residues generated by the wet FGD so that they can be used as a substitute for mined gypsum (e.g. as raw material in the plasterboard industry). The quality of limestone used in the wet FGD influences the purity of the gypsum produced</td> <td data-bbox="1079 608 1491 762">Generally applicable within the constraints associated with the required gypsum quality, the health requirements associated to each specific use, and by the market conditions</td> </tr> <tr> <td data-bbox="322 762 573 898">b. Recycling or recovery of residues in the construction sector</td> <td data-bbox="573 762 1079 898">Recycling or recovery of residues (e.g. from semi-dry desulphurisation processes, fly ash, bottom ash) as a construction material (e.g. in road building, to replace sand in concrete production, or in the cement industry)</td> <td data-bbox="1079 762 1491 898">Generally applicable within the constraints associated with the required material quality (e.g. physical properties, content of harmful substances) associated to each specific use, and by the market conditions</td> </tr> <tr> <td data-bbox="322 898 573 1007">c. Energy recovery by using waste in the fuel mix</td> <td data-bbox="573 898 1079 1007">The residual energy content of carbon-rich ash and sludges generated by the combustion of coal, lignite, heavy fuel oil, peat or biomass can be recovered for example by mixing with the fuel</td> <td data-bbox="1079 898 1491 1007">Generally applicable where plants can accept waste in the fuel mix and are technically able to feed the fuels into the combustion chamber</td> </tr> <tr> <td data-bbox="322 1007 573 1161">d. Preparation of spent catalyst for reuse</td> <td data-bbox="573 1007 1079 1161">Preparation of catalyst for reuse (e.g. up to four times for SCR catalysts) restores some or all of the original performance, extending the service life of the catalyst to several decades. Preparation of spent catalyst for reuse is integrated in a catalyst management scheme</td> <td data-bbox="1079 1007 1491 1161">The applicability may be limited by the mechanical condition of the catalyst and the required performance with respect to controlling NO_x and NH₃ emissions</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Generation of gypsum as a by-product	Quality optimisation of the calcium-based reaction residues generated by the wet FGD so that they can be used as a substitute for mined gypsum (e.g. as raw material in the plasterboard industry). The quality of limestone used in the wet FGD influences the purity of the gypsum produced	Generally applicable within the constraints associated with the required gypsum quality, the health requirements associated to each specific use, and by the market conditions	b. Recycling or recovery of residues in the construction sector	Recycling or recovery of residues (e.g. from semi-dry desulphurisation processes, fly ash, bottom ash) as a construction material (e.g. in road building, to replace sand in concrete production, or in the cement industry)	Generally applicable within the constraints associated with the required material quality (e.g. physical properties, content of harmful substances) associated to each specific use, and by the market conditions	c. Energy recovery by using waste in the fuel mix	The residual energy content of carbon-rich ash and sludges generated by the combustion of coal, lignite, heavy fuel oil, peat or biomass can be recovered for example by mixing with the fuel	Generally applicable where plants can accept waste in the fuel mix and are technically able to feed the fuels into the combustion chamber	d. Preparation of spent catalyst for reuse	Preparation of catalyst for reuse (e.g. up to four times for SCR catalysts) restores some or all of the original performance, extending the service life of the catalyst to several decades. Preparation of spent catalyst for reuse is integrated in a catalyst management scheme	The applicability may be limited by the mechanical condition of the catalyst and the required performance with respect to controlling NO _x and NH ₃ emissions		
Technique	Description	Applicability																
a. Generation of gypsum as a by-product	Quality optimisation of the calcium-based reaction residues generated by the wet FGD so that they can be used as a substitute for mined gypsum (e.g. as raw material in the plasterboard industry). The quality of limestone used in the wet FGD influences the purity of the gypsum produced	Generally applicable within the constraints associated with the required gypsum quality, the health requirements associated to each specific use, and by the market conditions																
b. Recycling or recovery of residues in the construction sector	Recycling or recovery of residues (e.g. from semi-dry desulphurisation processes, fly ash, bottom ash) as a construction material (e.g. in road building, to replace sand in concrete production, or in the cement industry)	Generally applicable within the constraints associated with the required material quality (e.g. physical properties, content of harmful substances) associated to each specific use, and by the market conditions																
c. Energy recovery by using waste in the fuel mix	The residual energy content of carbon-rich ash and sludges generated by the combustion of coal, lignite, heavy fuel oil, peat or biomass can be recovered for example by mixing with the fuel	Generally applicable where plants can accept waste in the fuel mix and are technically able to feed the fuels into the combustion chamber																
d. Preparation of spent catalyst for reuse	Preparation of catalyst for reuse (e.g. up to four times for SCR catalysts) restores some or all of the original performance, extending the service life of the catalyst to several decades. Preparation of spent catalyst for reuse is integrated in a catalyst management scheme	The applicability may be limited by the mechanical condition of the catalyst and the required performance with respect to controlling NO _x and NH ₃ emissions																
17	<p>In order to reduce noise emissions, BAT is to use one or a combination of the techniques given below.</p> <table border="1" data-bbox="322 1209 1491 1342"> <thead> <tr> <th data-bbox="322 1209 573 1246">Technique</th> <th data-bbox="573 1209 1079 1246">Description</th> <th data-bbox="1079 1209 1491 1246">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1246 573 1342">a. Operational measures</td> <td data-bbox="573 1246 1079 1342">These include: <ul style="list-style-type: none"> — improved inspection and maintenance of equipment </td> <td data-bbox="1079 1246 1491 1342">Generally applicable</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Operational measures	These include: <ul style="list-style-type: none"> — improved inspection and maintenance of equipment 	Generally applicable	CC	<p>Equipment is operated by experienced staff and scheduled preventative maintenance in place.</p> <p>The gas turbine intake and exhaust systems are housed in an</p>									
Technique	Description	Applicability																
a. Operational measures	These include: <ul style="list-style-type: none"> — improved inspection and maintenance of equipment 	Generally applicable																

BAT Concn. Number	Summary of BAT Conclusion requirement			Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement						
		<ul style="list-style-type: none"> — closing of doors and windows of enclosed areas, if possible — equipment operated by experienced staff — avoidance of noisy activities at night, if possible — provisions for noise control during maintenance activities 			<p>acoustically insulated building. Compressors are in the same building as gas turbine with acoustically lagged compressor pipework.</p> <p>Depressurisation valves and vents; high velocity vents are required for atmospheric dispersion (safety requirement). However their use, including running for maintenance, is infrequent.</p>						
	b. Low-noise equipment	This potentially includes compressors, pumps and disks	Generally applicable when the equipment is new or replaced								
	c. Noise attenuation	Noise propagation can be reduced by inserting obstacles between the emitter and the receiver. Appropriate obstacles include protection walls, embankments and buildings	Generally applicable to new plants. In the case of existing plants, the insertion of obstacles may be restricted by lack of space								
	d. Noise-control equipment	This includes: <ul style="list-style-type: none"> — noise-reducers — equipment insulation — enclosure of noisy equipment — soundproofing of buildings 	The applicability may be restricted by lack of space								
	e. Appropriate location of equipment and buildings	Noise levels can be reduced by increasing the distance between the emitter and the receiver and by using buildings as noise screens	Generally applicable to new plant								
Combustion of gaseous fuels											
40	In order to increase the energy efficiency of natural gas combustion, BAT is to use an appropriate combination of the techniques given in BAT 12 and below.			CC	BAT 12: a, b, d, f, and g. LCP 238 – BATc 12 is not applicable to plant which operates less than 1500 hours per year. Combined cycle is not applicable to mechanical drive gas turbines operated in discontinuous mode						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;">Technique</th> <th style="width: 20%;">Description</th> <th style="width: 70%;">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="322 1209 501 1262">a. Combined cycle</td> <td data-bbox="501 1209 725 1262">See description in Section 8.2</td> <td data-bbox="725 1209 1509 1396"> Generally applicable to new gas turbines and engines except when operated < 1 500 h/yr. Applicable to existing gas turbines and engines within the constraints associated with the steam cycle design and the space availability. Not applicable to existing gas turbines and engines operated < 1 500 h/yr. Not applicable to mechanical drive gas turbines operated in discontinuous mode with extended load variations and frequent start-ups and shutdowns. </td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Combined cycle	See description in Section 8.2	Generally applicable to new gas turbines and engines except when operated < 1 500 h/yr. Applicable to existing gas turbines and engines within the constraints associated with the steam cycle design and the space availability. Not applicable to existing gas turbines and engines operated < 1 500 h/yr. Not applicable to mechanical drive gas turbines operated in discontinuous mode with extended load variations and frequent start-ups and shutdowns.				
Technique	Description	Applicability									
a. Combined cycle	See description in Section 8.2	Generally applicable to new gas turbines and engines except when operated < 1 500 h/yr. Applicable to existing gas turbines and engines within the constraints associated with the steam cycle design and the space availability. Not applicable to existing gas turbines and engines operated < 1 500 h/yr. Not applicable to mechanical drive gas turbines operated in discontinuous mode with extended load variations and frequent start-ups and shutdowns.									

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																																																																							
	<table border="1"> <tr> <td data-bbox="320 384 501 419"></td> <td data-bbox="501 384 725 419"></td> <td colspan="3" data-bbox="725 384 1494 419">Not applicable to boilers</td> </tr> <tr> <td colspan="5" data-bbox="320 419 1494 451">BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of natural gas</td> </tr> <tr> <th data-bbox="320 451 595 603" rowspan="3">Type of combustion unit</th> <th colspan="4" data-bbox="595 451 1494 483">BAT-AEELs ⁽¹³⁶⁾ ⁽¹³⁷⁾</th> </tr> <tr> <th colspan="2" data-bbox="595 483 857 544">Net electrical efficiency (%)</th> <th data-bbox="857 483 1137 544" rowspan="2">Net total fuel utilisation (%) ⁽¹³⁸⁾ ⁽¹³⁹⁾</th> <th colspan="2" data-bbox="1137 483 1494 544">Net mechanical energy efficiency (%) ⁽¹³⁹⁾ ⁽¹⁴⁰⁾</th> </tr> <tr> <th data-bbox="595 544 712 603">New unit</th> <th data-bbox="712 544 857 603">Existing unit</th> <th data-bbox="1137 544 1290 603">New unit</th> <th data-bbox="1290 544 1494 603">Existing unit</th> </tr> <tr> <td data-bbox="320 603 595 663">Gas engine</td> <td data-bbox="595 603 712 663">39,5–44 ⁽¹⁴¹⁾</td> <td data-bbox="712 603 857 663">35–44 ⁽¹⁴¹⁾</td> <td data-bbox="857 603 1137 663">56–85 ⁽¹⁴¹⁾</td> <td colspan="2" data-bbox="1137 603 1494 663">No BAT-AEEL.</td> </tr> <tr> <td data-bbox="320 663 595 695">Gas-fired boiler</td> <td data-bbox="595 663 712 695">39–42,5</td> <td data-bbox="712 663 857 695">38–40</td> <td data-bbox="857 663 1137 695">78–95</td> <td colspan="2" data-bbox="1137 663 1494 695">No BAT-AEEL.</td> </tr> <tr> <td data-bbox="320 695 595 756">Open cycle gas turbine, ≥ 50 MW_{th}</td> <td data-bbox="595 695 712 756">36–41,5</td> <td data-bbox="712 695 857 756">33–41,5</td> <td data-bbox="857 695 1137 756">No BAT-AEEL</td> <td data-bbox="1137 695 1290 756">36,5–41</td> <td data-bbox="1290 695 1494 756">33,5–41</td> </tr> <tr> <td colspan="5" data-bbox="320 756 1494 788" style="text-align: center;">Combined cycle gas turbine (CCGT)</td> </tr> <tr> <td data-bbox="320 788 595 836">CCGT, 50–600 MW_{th}</td> <td data-bbox="595 788 712 836">53–58,5</td> <td data-bbox="712 788 857 836">46–54</td> <td data-bbox="857 788 1137 836">No BAT-AEEL</td> <td colspan="2" data-bbox="1137 788 1494 836">No BAT-AEEL</td> </tr> <tr> <td data-bbox="320 836 595 868">CCGT, ≥ 600 MW_{th}</td> <td data-bbox="595 836 712 868">57–60,5</td> <td data-bbox="712 836 857 868">50–60</td> <td data-bbox="857 836 1137 868">No BAT-AEEL</td> <td colspan="2" data-bbox="1137 836 1494 868">No BAT-AEEL</td> </tr> <tr> <td data-bbox="320 868 595 900">CHP CCGT, 50–600 MW_{th}</td> <td data-bbox="595 868 712 900">53–58,5</td> <td data-bbox="712 868 857 900">46–54</td> <td data-bbox="857 868 1137 900">65–95</td> <td colspan="2" data-bbox="1137 868 1494 900">No BAT-AEEL</td> </tr> <tr> <td data-bbox="320 900 595 932">CHP CCGT, ≥ 600 MW_{th}</td> <td data-bbox="595 900 712 932">57–60,5</td> <td data-bbox="712 900 857 932">50–60</td> <td data-bbox="857 900 1137 932">65–95</td> <td colspan="2" data-bbox="1137 900 1494 932">No BAT-AEEL</td> </tr> </table>			Not applicable to boilers			BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of natural gas					Type of combustion unit	BAT-AEELs ⁽¹³⁶⁾ ⁽¹³⁷⁾				Net electrical efficiency (%)		Net total fuel utilisation (%) ⁽¹³⁸⁾ ⁽¹³⁹⁾	Net mechanical energy efficiency (%) ⁽¹³⁹⁾ ⁽¹⁴⁰⁾		New unit	Existing unit	New unit	Existing unit	Gas engine	39,5–44 ⁽¹⁴¹⁾	35–44 ⁽¹⁴¹⁾	56–85 ⁽¹⁴¹⁾	No BAT-AEEL.		Gas-fired boiler	39–42,5	38–40	78–95	No BAT-AEEL.		Open cycle gas turbine, ≥ 50 MW _{th}	36–41,5	33–41,5	No BAT-AEEL	36,5–41	33,5–41	Combined cycle gas turbine (CCGT)					CCGT, 50–600 MW _{th}	53–58,5	46–54	No BAT-AEEL	No BAT-AEEL		CCGT, ≥ 600 MW _{th}	57–60,5	50–60	No BAT-AEEL	No BAT-AEEL		CHP CCGT, 50–600 MW _{th}	53–58,5	46–54	65–95	No BAT-AEEL		CHP CCGT, ≥ 600 MW _{th}	57–60,5	50–60	65–95	No BAT-AEEL			<p>with extended load variations and frequent start-ups and shutdowns.</p> <p>The net mechanical efficiency of LCP239 and LCP240 is 33.3%. This is based on product data from the original equipment manufacturer. These LCP do not meet the BAT-AEEL range for this type of plant. However, they are operated under a Limited Life Derogation (LLD). We are therefore satisfied that it would not be cost effective for any upgrades to this plant and that the current net mechanical efficiency is BAT.</p> <p>For LCP 238, Table 23 of the LCP BAT Conclusions specifies that the BAT-AEELs are not applicable to plant operating less than 1500 hours per year.</p> <p>A process monitoring requirement has been set in table S3.3 which requires energy efficiency monitoring after an overhaul.</p>
		Not applicable to boilers																																																																								
BAT-associated energy efficiency levels (BAT-AEELs) for the combustion of natural gas																																																																										
Type of combustion unit	BAT-AEELs ⁽¹³⁶⁾ ⁽¹³⁷⁾																																																																									
	Net electrical efficiency (%)		Net total fuel utilisation (%) ⁽¹³⁸⁾ ⁽¹³⁹⁾	Net mechanical energy efficiency (%) ⁽¹³⁹⁾ ⁽¹⁴⁰⁾																																																																						
	New unit	Existing unit		New unit	Existing unit																																																																					
Gas engine	39,5–44 ⁽¹⁴¹⁾	35–44 ⁽¹⁴¹⁾	56–85 ⁽¹⁴¹⁾	No BAT-AEEL.																																																																						
Gas-fired boiler	39–42,5	38–40	78–95	No BAT-AEEL.																																																																						
Open cycle gas turbine, ≥ 50 MW _{th}	36–41,5	33–41,5	No BAT-AEEL	36,5–41	33,5–41																																																																					
Combined cycle gas turbine (CCGT)																																																																										
CCGT, 50–600 MW _{th}	53–58,5	46–54	No BAT-AEEL	No BAT-AEEL																																																																						
CCGT, ≥ 600 MW _{th}	57–60,5	50–60	No BAT-AEEL	No BAT-AEEL																																																																						
CHP CCGT, 50–600 MW _{th}	53–58,5	46–54	65–95	No BAT-AEEL																																																																						
CHP CCGT, ≥ 600 MW _{th}	57–60,5	50–60	65–95	No BAT-AEEL																																																																						
41	In order to prevent or reduce NO _x emissions to air from the combustion of natural gas in boilers, BAT is to use one or a combination of the techniques given in BAT 41.	NA	Not applicable to Gas Turbines																																																																							
42	<p>In order to prevent or reduce NO_x emissions to air from the combustion of natural gas in gas turbines, BAT is to use one or a combination of the techniques given below.</p> <table border="1"> <thead> <tr> <th data-bbox="320 1278 535 1310">Technique</th> <th data-bbox="535 1278 1095 1310">Description</th> <th data-bbox="1095 1278 1494 1310">Applicability</th> </tr> </thead> <tbody> <tr> <td data-bbox="320 1310 535 1374">a. Advanced control system</td> <td data-bbox="535 1310 1095 1374">See description in Section 8.3.</td> <td data-bbox="1095 1310 1494 1374">The applicability to old combustion plants may be constrained by the need</td> </tr> </tbody> </table>	Technique	Description	Applicability	a. Advanced control system	See description in Section 8.3.	The applicability to old combustion plants may be constrained by the need	CC	LCP239 and LCP240 are operated under a LLD. This means that the operator has agreed that the plant will not operate past 31 December 2023. The operator has stated that the																																																																	
Technique	Description	Applicability																																																																								
a. Advanced control system	See description in Section 8.3.	The applicability to old combustion plants may be constrained by the need																																																																								

BAT Concn. Number	Summary of BAT Conclusion requirement				Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
			This technique is often used in combination with other techniques or may be used alone for combustion plants operated < 500 h/yr	to retrofit the combustion system and/or control command system		<p>units are old technology and it is not financially feasible to upgrade due to the limited life of the units. We are satisfied that it would not be cost effective for any upgrades to this plant. If the operator intends to continue operation after 31 December 2023 they will require a permit variation and the requirements of these BAT Conclusions will apply. There are no BAT-AELs for plant operating under a LLD.</p> <p>LCP238 does not have applicable BAT-AELs.</p> <p>We consider that the techniques described by this BAT conclusion are not applicable to LCP238 because:</p> <ul style="list-style-type: none"> - It operates less than 500 hours per year; - There are currently no NOx emission reduction options available; - Selective catalytic reduction (SCR) is not applicable to combustion plants operated less than 500 hour year. <p>In making this assessment, we have considered the reference technical information available within the Joint Environmental</p>
b.	Water/steam addition	See description in Section 8.3	The applicability may be limited due to water availability			
c.	Dry low-NO _x burners (DLN)		The applicability may be limited in the case of turbines where a retrofit package is not available or when water/steam addition systems are installed			
d.	Low-load design concept	Adaptation of the process control and related equipment to maintain good combustion efficiency when the demand in energy varies, e.g. by improving the inlet airflow control capability or by splitting the combustion process into decoupled combustion stages	The applicability may be limited by the gas turbine design			
e.	Low-NO _x burners (LNB)	See description in Section 8.3	Generally applicable to supplementary firing for heat recovery steam generators (HRSGs) in the case of combined-cycle gas turbine (CCGT) combustion plants			
f.	Selective catalytic reduction (SCR)		Not applicable in the case of combustion plants operated < 500 h/yr. Not generally applicable to existing combustion plants of < 100 MW _{th} . Retrofitting existing combustion plants may be constrained by the availability of sufficient space. There may be technical and economic restrictions for retrofitting existing combustion plants operated between 500 h/yr and 1 500 h/yr			

BAT Concn. Number	Summary of BAT Conclusion requirement	Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement																																														
			Programme (JEP) report UTG/18/PMP/774/R. Further details are discussed in the key issues section.																																														
43	In order to prevent or reduce NO _x emissions to air from the combustion of natural gas in engines, BAT is to use one or a combination of the techniques given in BAT 43.	NA	Not applicable to Gas Turbines																																														
44	<p>In order to prevent or reduce CO emissions to air from the combustion of natural gas, BAT is to ensure optimised combustion and/or to use oxidation catalysts.</p> <p>Description - See descriptions in Section 8.3.</p> <p>BAT-associated emission levels (BAT-AELs) for NO_x emissions to air from the combustion of natural gas in gas turbines</p> <table border="1" data-bbox="322 722 1494 1366"> <thead> <tr> <th data-bbox="322 722 786 842" rowspan="2">Type of combustion plant</th> <th data-bbox="786 722 1028 842" rowspan="2">Combustion plant total rated thermal input (MW_{th})</th> <th colspan="2" data-bbox="1028 722 1494 754">BAT-AELs (mg/Nm³) ⁽¹⁴²⁾ ⁽¹⁴³⁾</th> </tr> <tr> <th data-bbox="1028 754 1252 842">Yearly average ⁽¹⁴⁴⁾ ⁽¹⁴⁵⁾</th> <th data-bbox="1252 754 1494 842">Daily average or average over the sampling period</th> </tr> </thead> <tbody> <tr> <td colspan="4" data-bbox="322 842 1494 882" style="text-align: center;">Open-cycle gas turbines (OCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁷⁾</td> </tr> <tr> <td data-bbox="322 882 786 922">New OCGT</td> <td data-bbox="786 882 1028 922">≥ 50</td> <td data-bbox="1028 882 1252 922">15–35</td> <td data-bbox="1252 882 1494 922">25–50</td> </tr> <tr> <td data-bbox="322 922 786 1007">Existing OCGT (excluding turbines for mechanical drive applications) — All but plants operated < 500 h/yr</td> <td data-bbox="786 922 1028 1007">≥ 50</td> <td data-bbox="1028 922 1252 1007">15–50</td> <td data-bbox="1252 922 1494 1007">25–55 ⁽¹⁴⁸⁾</td> </tr> <tr> <td colspan="4" data-bbox="322 1007 1494 1046" style="text-align: center;">Combined-cycle gas turbines (CCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁹⁾</td> </tr> <tr> <td data-bbox="322 1046 786 1086">New CCGT</td> <td data-bbox="786 1046 1028 1086">≥ 50</td> <td data-bbox="1028 1046 1252 1086">10–30</td> <td data-bbox="1252 1046 1494 1086">15–40</td> </tr> <tr> <td data-bbox="322 1086 786 1142">Existing CCGT with a net total fuel utilisation of < 75 %</td> <td data-bbox="786 1086 1028 1142">≥ 600</td> <td data-bbox="1028 1086 1252 1142">10–40</td> <td data-bbox="1252 1086 1494 1142">18–50</td> </tr> <tr> <td data-bbox="322 1142 786 1198">Existing CCGT with a net total fuel utilisation of ≥ 75 %</td> <td data-bbox="786 1142 1028 1198">≥ 600</td> <td data-bbox="1028 1142 1252 1198">10–50</td> <td data-bbox="1252 1142 1494 1198">18–55 ⁽¹⁵⁰⁾</td> </tr> <tr> <td data-bbox="322 1198 786 1254">Existing CCGT with a net total fuel utilisation of < 75 %</td> <td data-bbox="786 1198 1028 1254">50–600</td> <td data-bbox="1028 1198 1252 1254">10–45</td> <td data-bbox="1252 1198 1494 1254">35–55</td> </tr> <tr> <td data-bbox="322 1254 786 1310">Existing CCGT with a net total fuel utilisation of ≥ 75 %</td> <td data-bbox="786 1254 1028 1310">50–600</td> <td data-bbox="1028 1254 1252 1310">25–50 ⁽¹⁵¹⁾</td> <td data-bbox="1252 1254 1494 1310">35–55 ⁽¹⁵²⁾</td> </tr> <tr> <td colspan="4" data-bbox="322 1310 1494 1366" style="text-align: center;">Open- and combined-cycle gas turbines</td> </tr> </tbody> </table>	Type of combustion plant	Combustion plant total rated thermal input (MW _{th})	BAT-AELs (mg/Nm ³) ⁽¹⁴²⁾ ⁽¹⁴³⁾		Yearly average ⁽¹⁴⁴⁾ ⁽¹⁴⁵⁾	Daily average or average over the sampling period	Open-cycle gas turbines (OCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁷⁾				New OCGT	≥ 50	15–35	25–50	Existing OCGT (excluding turbines for mechanical drive applications) — All but plants operated < 500 h/yr	≥ 50	15–50	25–55 ⁽¹⁴⁸⁾	Combined-cycle gas turbines (CCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁹⁾				New CCGT	≥ 50	10–30	15–40	Existing CCGT with a net total fuel utilisation of < 75 %	≥ 600	10–40	18–50	Existing CCGT with a net total fuel utilisation of ≥ 75 %	≥ 600	10–50	18–55 ⁽¹⁵⁰⁾	Existing CCGT with a net total fuel utilisation of < 75 %	50–600	10–45	35–55	Existing CCGT with a net total fuel utilisation of ≥ 75 %	50–600	25–50 ⁽¹⁵¹⁾	35–55 ⁽¹⁵²⁾	Open- and combined-cycle gas turbines				NA	<p>The BAT-AELs are not applicable.</p> <p>LCP 238 is operated <500hours per year for emergency use, therefore indicative BAT does not apply.</p> <p>For LCP 239 and LCP 240, Operators of combustion plants that have opted for the LLD do not have to comply with the BATcs applicable to the air pollutants that are subject to the LLD. Therefore the current emission limits will be retained and we have not set any additional or revised emission limits for these LCPs as part of this review.</p>
Type of combustion plant	Combustion plant total rated thermal input (MW _{th})			BAT-AELs (mg/Nm ³) ⁽¹⁴²⁾ ⁽¹⁴³⁾																																													
		Yearly average ⁽¹⁴⁴⁾ ⁽¹⁴⁵⁾	Daily average or average over the sampling period																																														
Open-cycle gas turbines (OCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁷⁾																																																	
New OCGT	≥ 50	15–35	25–50																																														
Existing OCGT (excluding turbines for mechanical drive applications) — All but plants operated < 500 h/yr	≥ 50	15–50	25–55 ⁽¹⁴⁸⁾																																														
Combined-cycle gas turbines (CCGTs) ⁽¹⁴⁶⁾ ⁽¹⁴⁹⁾																																																	
New CCGT	≥ 50	10–30	15–40																																														
Existing CCGT with a net total fuel utilisation of < 75 %	≥ 600	10–40	18–50																																														
Existing CCGT with a net total fuel utilisation of ≥ 75 %	≥ 600	10–50	18–55 ⁽¹⁵⁰⁾																																														
Existing CCGT with a net total fuel utilisation of < 75 %	50–600	10–45	35–55																																														
Existing CCGT with a net total fuel utilisation of ≥ 75 %	50–600	25–50 ⁽¹⁵¹⁾	35–55 ⁽¹⁵²⁾																																														
Open- and combined-cycle gas turbines																																																	

BAT Concn. Number	Summary of BAT Conclusion requirement				Status NA/ CC / FC / NC	Assessment of the installation capability and any alternative techniques proposed by the operator to demonstrate compliance with the BAT Conclusion requirement
	Gas turbine put into operation no later than 27 November 2003, or existing gas turbine for emergency use and operated < 500 h/yr	≥ 50	No BAT-AEL	60–140 ⁽¹⁵³⁾ ⁽¹⁵⁴⁾		
	Existing gas turbine for mechanical drive applications — All but plants operated < 500 h/yr	≥ 50	15–50 ⁽¹⁵⁵⁾	25–55 ⁽¹⁵⁶⁾		
<p>As an indication, the yearly average CO emission levels for each type of existing combustion plant operated ≥ 1 500 h/yr and for each type of new combustion plant will generally be as follows:</p> <ul style="list-style-type: none"> — New OCGT of ≥ 50 MW_{th}: < 5–40 mg/Nm³. For plants with a net electrical efficiency (EE) greater than 39 %, a correction factor may be applied to the higher end of this range, corresponding to [higher end] × EE/39, where EE is the net electrical energy efficiency or net mechanical energy efficiency of the plant determined at ISO baseload conditions. — Existing OCGT of ≥ 50 MW_{th} (excluding turbines for mechanical drive applications): < 5–40 mg/Nm³. The higher end of this range will generally be 80 mg/Nm³ in the case of existing plants that cannot be fitted with dry techniques for NO_x reduction, or 50 mg/Nm³ for plants that operate at low load. — New CCGT of ≥ 50 MW_{th}: < 5–30 mg/Nm³. For plants with a net electrical efficiency (EE) greater than 55 %, a correction factor may be applied to the higher end of the range, corresponding to [higher end] × EE/55, where EE is the net electrical energy efficiency of the plant determined at ISO baseload conditions. — Existing CCGT of ≥ 50 MW_{th}: < 5–30 mg/Nm³. The higher end of this range will generally be 50 mg/Nm³ for plants that operate at low load. — Existing gas turbines of ≥ 50 MW_{th} for mechanical drive applications: < 5–40 mg/Nm³. The higher end of the range will generally be 50 mg/Nm³ when plants operate at low load. <p>In the case of a gas turbine equipped with DLN burners, these indicative levels correspond to when the DLN operation is effective.</p>						

6. Review and assessment of derogation requests made by the operator in relation to BAT Conclusions which include an associated emission level (AEL) value

The IED enables a competent authority to allow derogations from BAT AELs stated in BAT Conclusions under specific circumstances as detailed under Article 15(4):

By way of derogation from paragraph 3, and without prejudice to Article 18, the competent authority may, in specific cases, set less strict emission limit values. Such a derogation may apply only where an assessment shows that the achievement of emission levels associated with the best available techniques as described in BAT conclusions would lead to disproportionately higher costs compared to the environmental benefits due to:

(a) the geographical location or the local environmental conditions of the installation concerned; or

(b) the technical characteristics of the installation concerned.

As part of their Regulation 61 Note response, the operator has not requested a derogation from compliance with any AEL values.

7. Emissions to Water

The consolidated permit incorporates the two current discharges to controlled waters identified as W1 to W2.

There are no BAT AELs specified in the BAT Conclusions for this type of plant. There are also no additional treatment options identified as BAT for the installation. We have therefore not carried out any additional assessment of the emissions to water as part of this review.

8 Additional IED Chapter II requirements:

There are no additional IED Chapter II requirements addressed through the permit review.

9 Review and assessment of changes that are not part of the BAT Conclusions derived permit review.

This document should be read in conjunction with the application, supporting information and notice.

Aspect considered	Decision
Receipt of application	
Confidential information	A claim for commercial or industrial confidentiality has not been made.
Identifying confidential information	We have not identified information provided as part of the application that we consider to be confidential.
The site	
Biodiversity, heritage, landscape and nature conservation	<p>The application is within the relevant distance criteria of a site of heritage, landscape or nature conservation, and/or protected species or habitat.</p> <p>A full assessment of the application and its potential to affect the site(s)/species/habitat has not been carried out as part of the permit review process. We consider that the review will not affect the features of the site(s)/species/habitat as the conditions will provide at least the same level of protection as those in the previous permit and in some cases will provide a higher level of protection to those in the previous permit.</p> <p>We have not consulted Natural England on the application. The decision was taken in accordance with our guidance.</p>
Operating techniques	
General operating techniques	<p>We have reviewed the techniques used by the operator where they are relevant to the BAT Conclusions and compared these with the relevant guidance notes.</p> <p>The permit conditions ensure compliance with the relevant BREF, BAT Conclusions.</p>
Permit conditions	
Use of conditions other than those from the template	We have retained condition 2.3.4 relating to the annual Network Review. This is a condition of the permits for all National Grid Gas compressor stations.
Updating permit conditions during consolidation	We have updated permit conditions to those in the current generic permit template as part of permit consolidation. The conditions will provide at least the same level of protection as those in the previous permit and in some cases will provide a higher level of protection to those in the previous permit.

Aspect considered	Decision
Changes to the permit conditions due to an Environment Agency initiated variation	We have varied the permit as stated in the variation notice.
Improvement programme	We have removed the completed improvement conditions from the permit.
Emission limits	<p>The current emission limits will be retained and we have not set any additional or revised emission limits as part of this review.</p> <p>LCP 238 is a gas turbine operated for Mechanical Drive, which is limited to less than 500 hours per year, therefore there are no applicable BAT-AELs.</p> <p>In 2015, the Operator chose to operate LCP 239 and LCP 240 under a Life Derogation (LLD) as described in Article 33(1)(a) of the Industrial Emissions Directive 2010/75/EU. This means the gas turbine will not be operated for more than 17,500 hours, starting from 1 January 2016 and ending no later than 31 December 2023. Operators of combustion plants that have opted for the LLD do not have to comply with the BATcs applicable to the air pollutants that are subject to the LLD.</p> <p>We have agreed to retain the current approach of recording hours of operation below 55% MCR. This is because the ELVs would have to be set very high which would not reflect environmental risk. This would further complicate an already complex system where more than one ELV is set. The environmental risk is low and we have decided to maintain monitoring using the number of operating hours in this mode as a proxy.</p>
Monitoring	<p>We have decided that monitoring should be carried out for the parameters listed in the permit, using the methods detailed and to the frequencies specified.</p> <p>These are described in the relevant BAT Conclusions in Section 5 of this document.</p> <p>Table S3.3 Process monitoring requirements was amended to include the requirement to monitor energy efficiency after overhauls on site in line with BAT2.</p> <p>Based on the information in the application we are satisfied that the operator's techniques, personnel and equipment have either MCERTS certification or MCERTS accreditation as appropriate.</p>
Operator competence	
Management system	There is no known reason to consider that the operator will not have the management system to enable it to comply with the permit conditions.

Aspect considered	Decision
Growth Duty	
<p>Section 108 Deregulation Act 2015 – Growth duty</p>	<p>We have considered our duty to have regard to the desirability of promoting economic growth set out in section 108(1) of the Deregulation Act 2015 and the guidance issued under section 110 of that Act in deciding whether to grant this permit.</p> <p>Paragraph 1.3 of the guidance says:</p> <p>“The primary role of regulators, in delivering regulation, is to achieve the regulatory outcomes for which they are responsible. For a number of regulators, these regulatory outcomes include an explicit reference to development or growth. The growth duty establishes economic growth as a factor that all specified regulators should have regard to, alongside the delivery of the protections set out in the relevant legislation.”</p> <p>We have addressed the legislative requirements and environmental standards to be set for this operation in the body of the decision document above. The guidance is clear at paragraph 1.5 that the growth duty does not legitimise non-compliance and its purpose is not to achieve or pursue economic growth at the expense of necessary protections.</p> <p>We consider the requirements and standards we have set in this permit are reasonable and necessary to avoid a risk of an unacceptable level of pollution. This also promotes growth amongst legitimate operators because the standards applied to the operator are consistent across businesses in this sector and have been set to achieve the required legislative standards.</p>