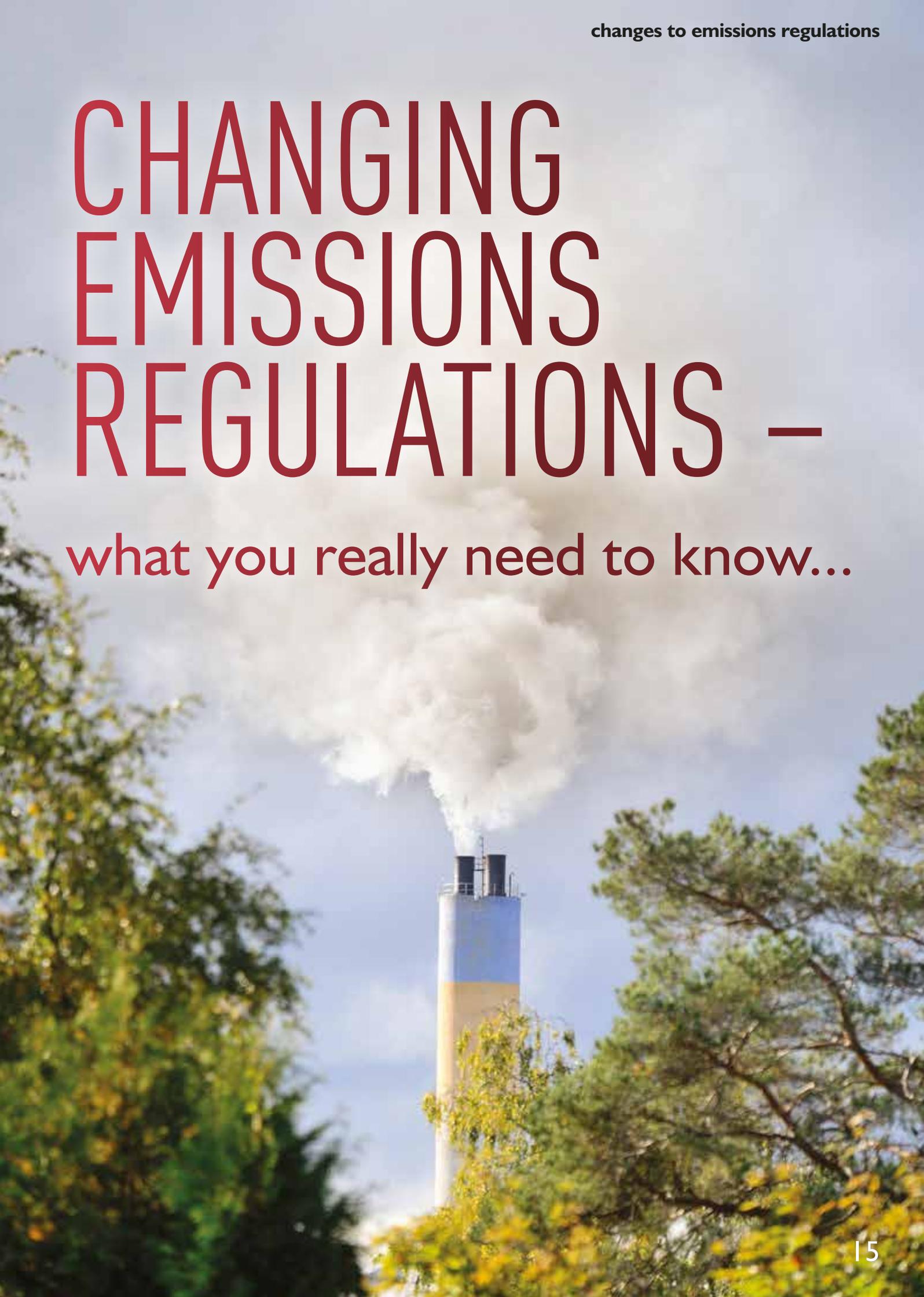


CHANGING EMISSIONS REGULATIONS –

what you really need to know...



changes to emissions regulations

There have been several recent developments concerning limits of exhaust and other emissions from engines which will be of interest to AMPS members and we felt that it was worth summarising the current position. At the moment, we have new requirements for:

- Non-Road Mobile Machinery (NRMM) 'Stage V'. This is explained below, but includes transportable generating sets.
- Use of NRMM within the London Low Emissions Zone (LEZ) is already regulated. Contractors on the HS2 rail project will have restrictions placed on the permitted equipment.
- Medium Combustion Plant Directive (MCPD) is due to be transposed into UK law by 19th December 2017. DEFRA are the lead agency and are currently consulting on the requirements.
- Additional requirements applied to gen-sets operating in the capacity market in the UK.
- Landfill Gas Engines. These have been regulated since 2005, but the requirements were updated in 2010.

A summary of the requirements is included, together with the Large Combustion Plant Directive (LCPD), which applies to large thermal power stations.

AMPS are involved in this with national and international agencies and work in partnership with fellow members of Eurogen.

Firstly, let us briefly look at the position from the Global and National perspectives, in order to gain some perspective.

GLOBAL PERSPECTIVE

The United Nations has via the UNECE (United Nations Economic Commission for Europe) produced the Convention on Long-Range Transboundary Air Pollution (LRTAP convention). It is the main

international framework for cooperation and measures to limit and gradually reduce and prevent air pollution. 51 countries from the UNECE region are parties to the convention, including the EU member states, Canada, the United States and several countries in Central Asia.

Since its signature in 1979, the LRTAP convention has been extended by 8 specific protocols, including the 1999 protocol to stop acidification, eutrophication and ground-level ozone. This protocol is also known as 'the Gothenburg Protocol'.

Eutrophication, as you will know, is the term used for excessive richness of nutrients in a body of water, frequently due to run-off from the land, which causes a dense growth of plant life.

The World Health Organisation has developed air quality guidelines: www.who.int/phe/health_topics/outdoorair/outdoorair_aqg/en/

The European Union position on air quality is: ec.europa.eu/environment/air/quality/

UK AIR QUALITY STRATEGY

The UK Government has an Air Quality Strategy, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf and it is worth considering this, before we look at specific requirements for engine emissions.

This is being reviewed and is in consultation at the moment.

Quoting from the executive summary of the existing 2007 document:

“Aim: This Air Quality Strategy sets out air quality objectives and policy options to further improve air quality in the UK from today into the long term. As well as direct benefits to public health, these options are intended to provide important benefits to quality of life and help to protect our environment.

Our air is cleaner in overall terms than at any time since the industrial revolution, but it still causes serious adverse effects and there are significant benefits to be gained from improving air quality further. Recent research has shown that some pollutants are more dangerous than previously thought and we need to act faster and take further measures to move us closer to meeting our objectives. Pollutants from sources such as our cars, ships and industrial plants lead to levels of pollution which are still having a marked effect on our health and natural environment.

Air pollution is currently estimated to reduce the life expectancy of every person in the UK by an average of 7-8 months. The measures outlined in the strategy could help to reduce the impact on average life expectancy to five months by 2020, and provide a significant step forward in protecting our environment.

The current situation is positive in several respects. Over the past ten years the quality of our air has improved and we are meeting our current objectives for all air pollutants in over 99 per cent of the UK. From 1990 to 2001 the improvements have helped avoid an estimated 4,200 premature deaths per annum and 3,500 hospital admissions per annum.

However, there is still more to do. We are projected to miss objectives on three of our nine pollutants (particles, ozone and nitrogen dioxide). The areas of exceedance are relatively small, although significant numbers of people are likely to be exposed as the exceedances tend to be in highly populated areas. Critical loads for acidity and/or the fertilising effects of nitrogen I are exceeded in over half the UK's natural and semi-natural habitats.”

...the quality of our air has improved and we are meeting our current objectives in over 99 per cent of the UK

NON-ROAD MOBILE MACHINERY

The term non-road mobile machinery (NRMM) is a term used in European emission standards to control emissions of engines that are not used primarily on public roadways. This definition includes off-road vehicles as well as railway vehicles. Mobile generator sets are also included in this category.

European standards for non-road diesel engines harmonize with the US EPA standards, and comprise gradually stringent tiers known as Stage I - IV standards. Stage I/II was part of the 1997 directive (Directive 97/68/EC). It was implemented in two stages with Stage I implemented in 1999 and Stage II implemented between 2001 and 2004. In 2004, the European Parliament adopted Stage III/IV standards. The Stage III standards were further divided into Stage IIIA and IIIB, and were phased in between 2006 and 2013. Stage IV standards were enforced from 2014. For the constant speed engines typically used in generator sets only stage II and stage IIIA were implemented in 2007 and 2010/2011 respectively.

Regulation (EU) 2016/1628 'Stage V engine emissions' entered into force on 6 October 2016 and is applicable from 1 January 2017. As an EU Regulation, it has direct effect and need not be transposed into UK Law (Until Brexit!).

The AMPS Technical Committee and particularly Workgroup 5 – Emissions have been involved in the gestation of this important Regulation.

HOW WILL IT AFFECT OUR INDUSTRY?

We have issued (May 2017) a press statement issued jointly by European manufacturers represented by their respective trade associations. Also attached was a list of 97 FAQs also jointly developed by the above.

To prepare Members for reading 60 pages of FAQ and over 100 pages of EU Regulations here follows a summary. Please read the disclaimer at the end!

FAQ 1.2 states: Non-road mobile machinery is defined in the regulation as: “any mobile machine, transportable equipment or vehicle with or without bodywork or wheels, not intended for the transport of passengers or goods on roads, and includes machinery installed on the chassis of vehicles intended for the transport of passengers or goods on roads”.

So how is that relevant to the generating set industry?

FAQ 1.5 gives exemptions to the Regulation, one of these is stationary machinery.

FAQ 1.14 Explains the difference between mobile and stationary machinery.

The regulation describes stationary machinery as: “machinery that is intended to be permanently installed in one location for its first use and is not intended to be moved, by road or otherwise, except during shipment from the place of manufacture to the place of first installation”. Where permanently installed means: “bolted, or

otherwise effectively fixed so that it cannot be removed without the use of tools or equipment, to a foundation or an alternative constraint intended to cause the engine to operate in one single location in a building, structure, facility or installation”.

ALL OTHER MACHINERY IS CONSIDERED MOBILE

So, a generating set supplied to say a distribution centre and permanently installed, is out of scope, trailer mounted sets, rental sets OF ANY SIZE intended to be moved, are in scope. The FAQ summarise the requirements for engines and fuels, it should be noted that only specific fuels may be used (See **FAQ 16.1**), and no other fuels may be used, unless the engine has been type approved with these alternative fuels.

All NRMM engines including those for mobile generator sets will need to be type approved to stage V be placed on the market (unless subject to a transition scheme See **FAQ Section 3**). The stage V regulation, unlike the previous one, also applies to the machine or generator set. So, this also cannot be placed on the market without incorporating a stage V type approved engine.

FAQ 2.5 Says that production of engines other than stage V must stop, but this only applies to engines for NRMM, i.e. production of non-stage V engines for stationary plant can continue. See also **FAQ 3.1** (although the Medium Combustion Plant Directive, MCPD or other emissions regulations might apply).

GAS TURBINES ARE NOT CONSIDERED AN ENGINE

Ancillaries such as radiators are not part of the engine, BUT must comply with the engine manufacturers requirements, consistent with the type approval of the engine.

Exports outside the EU are exempted, but the engine must be marked in accordance with the regulations.

Spark ignition engines are included, e.g. for petrol and gas fuels.

With the exception of machines in which transition engines are installed, the machine must be placed on the market no later than:

- 31 December 2018 for engines below 56 kW and above 130 kW (<56 kW and ≥130 kW)
- 31 December 2019 for engines between 56 kW and 130 kW (56 kW ≤ P < 130 kW)

Replacement Engines are regulated in type and availability, (**FAQ 9.1;2;3**), but are time limited in availability.

So as a summary, it is easier to consider what generating sets are not covered by this and it is plant that are not designed to be moved during the operating life, so a generating set installed in a basement, should not be in scope, but a generating set in a container on a power park could be in scope. We have no legal case law and no official guidelines!

Transboundary Air Pollution (LRTAP convention) is the main international framework... to limit and gradually reduce and prevent air pollution



LARGE COMBUSTION PLANT DIRECTIVE

This is unlikely to have affected any AMPS member, but is included for completeness, and also to consider the effect.

The Large Combustion Plant Directive (LCPD, 2001/80/EC) was a European Union directive which required member states of the European Union to limit flue gas emissions from combustion plant having a thermal input of 50 MW_{th} or greater. The directive applied to fossil-fuel power stations, and other large plant such as refineries and steelworks.

The directive specified emission limits for sulphur dioxide, nitrogen oxides, and dust. The directive was issued in October 2001. It replaced the earlier EEC directive on large combustion plants, 88/609/EEC, issued in November 1988.

Under the terms of the directive, combustion plant built after 1987 had to comply with specific emissions limits. From 2007, plant built earlier than that could either opt to comply with the emissions limits, or 'opt out'. Plant which opted out were limited to a maximum of 20,000 hours of further operation, and had to close completely by the end of 2015.

As a result, 9 plants comprising 11.5 GW of capacity (oil and coal fired power stations) in the UK, have 'opted out' and have now closed, together with 205 similar plants in Europe.

The Large Combustion Plant Directive was superseded by the Industrial Emissions Directive on 1 January 2016.

MEDIUM COMBUSTION PLANT DIRECTIVE

The Large Combustion Plant Directive had a major effect on large power stations in the UK. So, the Medium Combustion Plant Directive which has followed should be taken seriously!

On the 16th November 2016, DEFRA published a consultation on proposals to introduce tight limits on NO_x emissions from small scale generation (i.e. with a capacity of 1-50 MW_{th}). This will entail compliance with the Medium Combustion Plant Directive (MCPD). The consultation closed on 8th February 2017, AMPS responded to the consultation and were involved in further discussions.

The Medium Combustion Plant Directive (MCPD) will help to reduce air pollution by bringing in emission controls for combustion plants in the 1 – 50 MW_{th} range. The MCPD is supported by the UK government as it will deliver a cost-effective improvement to air quality. The directive requires all plant in scope to be registered or permitted and sets limits on the levels of pollutants that these plants can emit per their type, size, age, fuel type and annual operating hours. It also requires operators to test emissions from their plants to demonstrate compliance with emission limits.

The MCPD must be transposed into UK law by the 19th December 2017. The controls will apply to new plants from December 2018. Existing plants must comply with requirements from 2024 or 2029, depending largely on size. Full implementation will be achieved in 2030.

DEFRA have issued a consultation to seek views on broad principles for transposition of the MCPD and emissions controls for generators into UK law. Associated guidance will be subject to a separate consultation by early 2018.

There are a series of workshops held in July 2017 by DEFRA, which AMPS will attend. We will report on any news gained.

Please note that there are additional requirements for generators involved in the Capacity Market (CM)

The consultations together with the documentation from DEFRA are complex, and should be read carefully, and in whole. We offer the following summary:

One of the key proposals is that any new build generator, in scope of the legislation and winning an agreement in this year's CM auction, will need to comply with a limit of 190 mg/Nm³ from 1 January 2019. For existing generators, this limit will apply from 2025 or 2030, depending on the generator capacity.



Other key points:

- Please note that the proposed emission controls for generators (combustion plant used to generate electricity) differ from those under the MCPD (in stringency and timescale) and apply to sites on which generators aggregate to a thermal input over 1 MW_{th} (~400 kW_e), regardless of the size of the individual generators.
- Subject to some limited exceptions, all MCPs (Medium Combustion Plants) which operate on average more than 500 hours per annum will be required to comply with the emission limit values. The term MCP includes water heaters and steam boilers, together with other combustion devices including engines and gas turbines.
- The MCPD contains an exemption for combustion plants covered by the Non-Road Mobile Machinery Directive (NRMM), as discussed above. The NRMM is being replaced with a new Regulation which will apply from January 2019 and will require all compression ignition engines installed in non-road mobile machinery (NRMM) within the MCP range to comply with 'placing on the market' emission standards. DEFRA consider that engines above 1 MW_{th} (~400 kW_e) installed on NRMM and not subject to placing on the market emission standards will be in scope of the MCPD, except where otherwise exempted by the MCPD.
- Regarding continuous emissions monitoring, DEFRA propose not to apply mandatory continuous monitoring, however:
 - DEFRA are working with industry and regulators to identify suitable methods of emissions monitoring. Under the MCPD the majority of MCPs (those using natural gas and gas oil) are required to monitor only NO_x and CO emissions and DEFRA consider that MCERTS (UK Monitoring Certification Scheme) is likely to be disproportionate. They are therefore working with industry to identify cheaper and less stringent methods possibly utilising existing plant maintenance systems.
 - Back-up generators (generators operating to supply power during an on-site emergency e.g. a power cut) which are operated for testing for no more than 50 hours per year are be exempted from the emission limit values.
 - Unless otherwise specified below, the regulator will be required to exercise their permitting functions so as to ensure that at least the four following standard requirements are applied to the generator though the permit:
 - A NO_x ELV (Emission Limit Value) of 190 mg/Nm³
 - Where secondary abatement is required to meet the limit of 190 mg/Nm³, it must be met within 10 or 20 minutes of the generator commencing operation.
 - There must be no persistent visible emission.
 - Where the generator relies on secondary abatement to meet the 190 mg/Nm³ NO_x ELV, emissions must be monitored every 3 years.



DEFRA are working with industry and regulators to identify suitable methods of emissions monitoring

changes to emissions regulations

- The term “Generators” will be defined. A possible definition is
 - any single stationary electricity generating combustion plant; or
 - any group of stationary electricity generating combustion plant located at the same site and providing electricity for the same purpose, with a rated thermal input of between 1 MW_{th} and 50 MW_{th}, including any MCP, but excluding any plant subject to the provisions of the Industrial Emissions Directive. The combined capacity of all stationary electricity generating combustion plant located at the same site will be aggregated to determine the total rated thermal input of the “Generator”, so plant < 1 MW_{th} may be affected by the proposed requirements. Mobile generator providing balancing services to the grid or connected to permanent infrastructure will be included.
- The permit conditions may limit the operating hours and emissions limits of the generator and may require dispersion equipment (e.g. stacks) or abatement equipment to be installed to ensure compliance with Ambient Air Quality Limits.
- Aggregators produce bids to National Grid services by combining the power from numbers of smaller generators on separate sites. Failing to limit NO_x emissions from these generators could open a loophole potentially undermining some of the benefits of the proposed regulation. DEFRA are therefore seeking views on whether the legislation should be extended to generators < 1 MW_{th} in size (~400 kW_e) aggregated in this way.

The proposed legislation to limit NO_x emissions is likely to affect diesel generators, as well as gas engines that are not lean-burn and gas turbines with higher NO_x emissions – DEFRA are advising that participants check whether the proposals restrict their ability to operate or increase operating and capital costs.

DEFRA propose to transpose the MCPD and introduce emission controls for generators through amendments to the Environmental Permitting (England and Wales) Regulations (2016).

If you would like to know more, please see the consultation document published on Defra’s website:

<https://consult.defra.gov.uk/airquality/medium-combustion-plant-and-controls-on-generators>

The consultation is now closed and the results can be found at:

<https://www.gov.uk/government/consultations/improving-air-quality-reducing-emissions-from-medium-combustion-plants-and-generators>

Scotland and Northern Ireland Governments will propose their own legislation.

CAPACITY MARKET

BEIS (Department for Business, Energy & Industrial Strategy) have advised that Government laid in Parliament an amendment to the Capacity Market Rules, following the recent consultation on selective over-compensation in the Capacity Market (“CM”). Documents are also published on their website:

<https://www.gov.uk/government/publications/selective-overcompensation-in-the-capacity-market>.

LONDON LOW EMISSION ZONE

The Mayor of London is introducing new standards to reduce emissions of pollutants from construction and demolition activity and associated equipment. In August 2014 the Mayor adopted the Control of Dust and Emissions from Construction and Demolition Supplementary Planning Guidance following extensive consultation. The SPG includes the world’s first Non-Road Mobile Machinery Low Emission Zone (NRMM LEZ) combining standards to address both nitrogen oxide (NO_x) and particulate matter (PM) emissions.

From 1st September 2015, construction equipment used on the site of any major development within Greater London will be required to meet the EU Stage IIIA as a minimum; and construction equipment used on any site within the Central Activity Zone or Canary Wharf will be required to meet the EU Stage IIIB standard as a minimum. Some exemptions have been provided where pieces of equipment are not available at the emission standard stipulated or in the volumes required to meet demand in a construction environment as dynamic as London’s.

The Greater London Authority issued the following:

Statement of Policy – March 2016 - Exemptions to The Non-Road Mobile Machinery (NRMM) Low Emission Zone

AMPS Working Group 5 - Emissions has been involved in commenting on the drafting of the above during the consultation stage. The document was published in 2016.

AMPS also have a seat on the GLA’s NRMM Policy Committee.

Stage IIIA generators are now accepted in the central area and Canary Wharf until 1st September 2018 which, after extensive lobbying, is much better than it might have been.

Please note the paragraph highlighted below regarding plant registration, even if the Plant is on site for less than 30 days.

The Mayor of London is introducing new standards to reduce emissions of pollutants from construction and demolition

As a summary of the requirements:

1.1 Exemption and retrofit policy rationale

The NRMM ‘EU stages’ are the basis for the NRMM Low Emission Zone emission requirements. Unlike ‘on highway’ applications, due to the broad range of non-road engine power and applications, the latest emission level varies according to the engine category. These emission levels are deemed appropriate for the given power and application of the engine. This has led to particular classes of NRMM plant on the market not being available at the EU stage stated in the Supplementary Planning Guidance (SPG), or in a volume insufficient to meet demand in London. Furthermore, options for re-engining or retrofitting NRMM plant to meet the latest emission stage are often limited owing to safety reasons or cost.

It is therefore necessary to outline a method of assessment for retrofit viability and exemption eligibility that secures emission savings without restricting construction activity and growth in the capital.

The GLA will review this exemption policy by summer 2017 to account for any changes in availability and demand for construction equipment and retrofit technologies. Subsequent reviews will then be undertaken on an annual basis with a 12-month lead-in time prior to any changes taking effect.

It is important to note that it remains a condition of the Control of Dust and Emissions from Construction and Demolition Supplementary Planning Guidance (SPG) that all NRMM plant is inputted on the NRMM register regardless of whether an exemption is being sought and/or has been granted.

1.4 Summary of exemptions

List of exemptions is defined here

1.5 Block exemptions

This will apply only until 1st September 2018

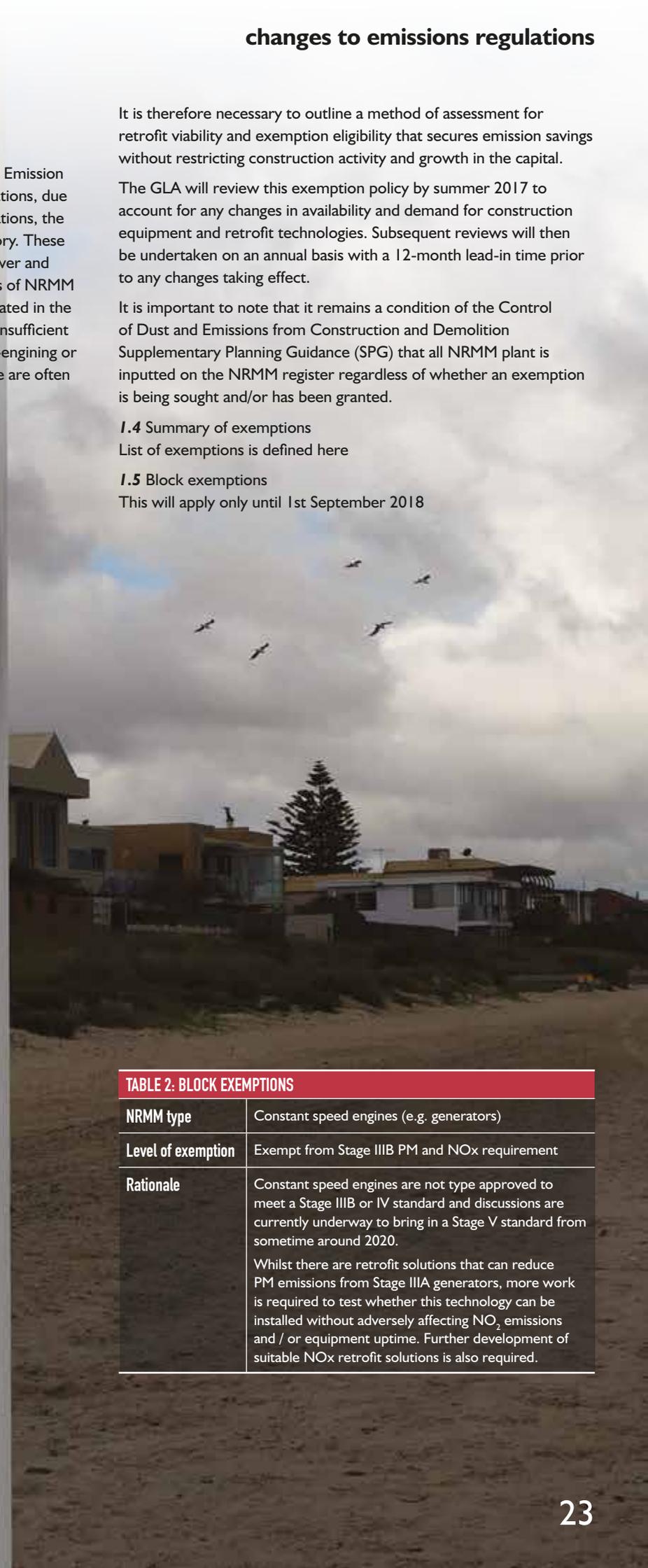


TABLE 2: BLOCK EXEMPTIONS

NRMM type	Constant speed engines (e.g. generators)
Level of exemption	Exempt from Stage IIIB PM and NOx requirement
Rationale	Constant speed engines are not type approved to meet a Stage IIIB or IV standard and discussions are currently underway to bring in a Stage V standard from sometime around 2020. Whilst there are retrofit solutions that can reduce PM emissions from Stage IIIA generators, more work is required to test whether this technology can be installed without adversely affecting NO ₂ emissions and / or equipment uptime. Further development of suitable NOx retrofit solutions is also required.

changes to emissions regulations

1.6 Viability Exemption

The GLA has been working with industry to identify suitable retrofit solutions so that all construction equipment in London meets the highest possible emissions standard. The GLA anticipates that a retrofit solution could be installed on the majority of NRMM plant. However, a 'Viability' exemption will be given in those instances where retrofit is demonstrated to be unviable.

The table defines the power bands and pollution reduction requirements.

Note that if a NO_x retrofit is unviable, then a PM (particulate matter) retrofit device shall still be considered.

1.7 Register of retrofit solutions and suppliers

Note that only registered retrofit emissions reduction systems are eligible for consideration.

1.8 Short-term exemption

There is a system for permitting non-compliant plant to be used in what will be seen as exceptional circumstances.

1.9 Applying for an exemption

Applications for an exemption must be submitted to the GLA via the NRMM register. <https://nrmm.london>

This is the same website as is used to register Plant

As member of the NRMM Policy Committee, AMPS will be engaging with the Committee during the operation of the procedures.

Whilst 'Stage V' will take over the requirements of this Policy, it is likely that the registration requirement will continue. Stage V is a placing on the market regulation whereas the London SPG is a restriction on usage. The policy is likely to be updated to take account of the availability of stage V engines.

LANDFILL GAS ENGINE EMISSIONS

The 'Guidance for Monitoring Landfill Gas Engine Emissions' was originally issued by the Environment Agency in 2005, in accordance with the Landfill Directive.

It was updated to 'LFG TN 08 v2 2010' by the Environment Agency and the Scottish Environment Protection Agency (SEPA) in 2010.

Please note that this is a 'Technical Note' (Technical Guidance Note in the original issue) accordingly it is only guidance, but it is 'pulled in' to be a specific requirement by virtue of the environmental permit which is required for any waste disposal site.

Having been updated, it is a mature, practical, experience based document and may give some idea of how the government could go in terms of monitoring under say the MCPD.

As a summary:

This document is mainly concerned with emissions from spark ignition engines and, in general, does not consider emissions from other forms of landfill gas utilisation such as dual-fuel engines and gas turbines.

TABLE B: SUMMARY OF EMISSIONS TESTING REQUIREMENTS FOR LANDFILL GAS SPARK IGNITION ENGINES COMMISSIONED AFTER 31 DECEMBER 2005.

Emission	Minimum Testing Frequency	Emission Limit
NO _x	Annually	500 mg/m ³
CO	Annually	1400 mg/m ³
VOC's	Annually	1000 mg/m ³

VOC = volatile organic compounds (e.g. unburnt methane)

Engines commissioned before 2005 have different requirements.

In addition to the numerical emission limits given in Table A, the following apply:

- Discharges must be vertically upwards and unimpeded by cowls or any other fixture on top of the exhaust.
- [Exhaust] sampling sockets must be fitted to all new installations and it is recommended that they are fitted to existing installations.
- The management of crankcase emissions to minimise their release to the environment is recommended.
- Continuous assessment of methane [% vol] and flow in the inlet gas is recommended.

1.1 Structure of this document

This is one of a series of linked documents that support the overarching document, Guidance on the management of landfill gas (Environment Agency). The full series comprises:

- Guidance for monitoring trace components in landfill gas
- Guidance for monitoring enclosed landfill gas flares
- Guidance for monitoring landfill gas engine emissions
- Guidance for monitoring landfill gas surface emissions
- Guidance on gas treatment technologies for landfill gas engines.

2.3

All engines should be considered on a site-specific risk basis and may necessitate a stricter emission standard either in terms of the generic emissions standard stated below (for example, reducing NO_x from 500 to 400 mg/m³) or in terms of additional parameters.

2.4

The Environment Agency may require additional monitoring and assessment for the following pollutants:

- Sulphur dioxide
- Hydrogen sulphide
- Dioxins (PCDD and PCDF)
- Heavy metals
- Halides and acid gases such as hydrochloric acid or hydrofluoric acid
- Particulates

4.1 List of required test parameters and methods

The parameters to be monitored during emissions testing of landfill gas engines will be specified in the EPR Permit.

4.3 Quality assurance of monitoring (MCERTS)

All annual compliance monitoring of engine emissions must be carried out using MCERTS accredited organisations, using the methods detailed in TGN M2. Results should be reported using the format shown in Appendix I.

To support annual compliance monitoring, additional routine maintenance and quarterly monitoring using handheld portable instruments is required. MCERTS accreditation or certification is not required for the organisations or individuals who perform this additional monitoring. However, MCERTS certification is required for the portable handheld monitoring instruments used.

4.6.2 Determination of compliance with the emission standard

All monitoring data is subject to error and uncertainty, and a determination of compliance must take account of this. The fundamental principle is that the emission standard itself is fixed and any allowance for uncertainty is associated with the monitoring data. Assessing compliance of landfill gas engine emissions is subject to the general principles applied to the regulation of other emissions.

- Compliance. All measurements giving outcomes that are within the standard, irrespective of uncertainty, we will regard as compliant.
- Approach to limit. All measurements giving outcomes that are above the standard, but by an amount that does not exceed the uncertainty, will be regarded as approaching the limit. These will be deemed compliant.
- Non-compliance. All measurements giving outcomes that are above the standard after subtracting the uncertainty, will be regarded as non-compliant.

The GLA has been working with industry so that all construction equipment in London meets the highest possible emissions standard

changes to emissions regulations

Finally, any transportable landfill gas fuelled gas generator sets could be considered to fall under the NRM Regulation. However, producing an engine which would run on landfill gas and meet stage V would be challenging. AMPS are continuing to consider this issue.

Any questions to: TechSec@AMPS.org.uk

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Manager Market Intelligence, Interxion

