

# Rail Delivery Group



## RDG Guidance Note: Reducing Diesel Emissions in Stations and Depots

RDG-OPS-GN-004  
Issue 1 – July 2021



## About this document

### Explanatory Note

The Rail Delivery Group is not a regulatory body and compliance with Guidance Notes or Approved Codes of Practice is not mandatory; they reflect good practice and are advisory only. Users are recommended to evaluate the guidance against their own arrangements in a structured and systematic way, noting that parts of the guidance may not be appropriate to their operations. It is recommended that this process of evaluation and any subsequent decision to adopt (or not adopt) elements of the guidance should be documented. Compliance with any or all of the contents herein, is entirely at an organisation's own discretion.

Other Guidance Notes or Approved Codes of Practice are available on the [Rail Delivery Group \(RDG\) website](#).

### Executive Summary:

This Guidance Note sets out the concept of railway undertakings producing a Diesel Engine Idling Reduction Plan. The Guidance Note suggests control measures that can reduce the risk to staff and neighbours by improving air quality and reducing noise by implementing strategies to reduce the occurrences of diesel idling.

### Issue Record

Issue	Date	Comments
1	July 2021	Initial framework document developed in line with the Air Quality Strategic Framework published by RSSB

This document is reviewed on a regular 3-year cycle.

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# 1 Purpose and Background

## 1.1 Purpose

The purpose of this document is to provide guidance to railway undertakings on developing a plan to reduce diesel engine idling at stations and depots.

## 1.2 Context

Poor air quality is the greatest environmental risk to public health in the UK and is known to exacerbate the impact of pre-existing health conditions, such as respiratory and cardio-vascular illnesses. It is estimated that long-term exposure to man-made air pollution in the UK has an effect equivalent to 28,000-36,000 deaths per year. In comparison to other transport modes and industries, rail's contribution across the country is low, however it can be a major contributor to certain air pollution hotspots, particularly through its use of diesel. There are areas of particular concern such as enclosed stations, where rail staff and the public may be exposed to high levels of air pollution.

In 2019, the Government published the Clean Air Strategy which focuses on five of the most damaging pollutants (from the 12 which have ambient air quality standards in the UK). Three of these pollutants are major constituents of diesel emissions: particulate matter (PM10 and PM2.5), nitrogen oxides (NO and NO<sub>2</sub> collectively known as NO<sub>x</sub>) and carbon monoxide (CO).

The Air Quality Strategic Framework published by RSSB in June 2020 recommended four industry actions about diesel engine idling, these were:

- i. Establish an industry-wide working group to tackle idling emissions. This should focus on operational measures and behavioural changes to achieve benefits without needing investment or significant train upgrades.
- ii. Agree industry-wide targets for maximum idling times in stations and other sensitive areas.
- iii. Develop an effective communication strategy to share new idling policy with relevant staff such as train drivers and dispatchers.
- iv. Update engine management systems for all modern DMUs to reduce engine operation in sensitive locations.

Some diesel trains need to idle their engines to keep on-board electrical and pneumatic systems running for heating, ventilation, air conditioning lighting and braking systems. Initial efforts have been made to reduce unnecessary idling, including the implementation of maximum idling times. However, the correct balance between idling and best practice passenger and staff comfort is yet to be achieved. Efforts to reduce idling have so far been operator, or route specific rather than a system wide initiative. Significant air quality improvements and local noise reduction could be achieved by a network wide coordinated effort to eliminate unnecessary idling through a combination of behavioural change, operational measures, and technical measures. By reducing diesel engine idling a significant benefit in fuel savings could be achieved by railway undertakings.

It is recognised that substantial research is currently being undertaken within the RSSB managed research programme and that this Guidance Note may require updating when the findings of this research is known.

## 1.3 Legislative background

### 1.3.1 Emissions regulations applicable to diesel engines

Ambient air quality regulations in the UK are derived from EU directive 2008/50/EC which sets limits for a range of pollutants over short- and long-term averaging periods.

In addition, there are planned to be industry agreed targets as an output from the RSSB T1233 Air Quality Targets project.

### 1.3.2 Workplace exposure limits

Many locations on the rail network are workplaces as well as being occupied by passengers and the public. Indicative occupational exposure limit values (IOELV) are health-based limits set under the Chemical Agents Directive (98/24/EC) to protect workers' health through exposure to natural or man-made substances at the workplace.

In Britain, the Health and Safety Executive (HSE) sets workplace exposure limits (WEL) (workplace exposure limits are for use with the Control of Substances Hazardous to Health Regulations 2002 (as amended)) to protect the health of workers. These are summarised in its EH40 document (HSE, 2020). WELs are set for time-weighted averages (TWA), usually for an 8-hour day during a 40-hour week. Also, for some substances, short-term exposure limits (STEL) are defined and refer to 15-min exposures.

## 1.4 Principle

The principle that underpins this Guidance Note is that the railway undertaking that operates the diesel idling train is responsible for preventing or mitigating the effects of such diesel idling. However, station operators have a responsibility to lead and coordinate any actions necessary on their station to reduce the exposure levels within its stations.

## 1.5 Definitions and abbreviations

Term	Meaning
<b>CMS</b>	Competency Management System
<b>Compressor Speed Up</b>	A facility to increase air pressure
<b>Depot Manager</b>	The management post in a TOC accountable for activities within the maintenance depot
<b>Driver</b>	Train or Depot Driver
<b>ECS</b>	Empty Coaching Stock
<b>Maintenance Depot</b>	Location for light or heavy maintenance
<b>OTDR</b>	On Train Data Recorder
<b>Shore Supply</b>	Electrical train 400v supplied at stations and maintenance depots
<b>Station Duties</b>	Preparation of train to include shunting, coupling and uncoupling

# 2 Strategies for Reducing Diesel Idling

## 2.1 Diesel Engine Idling Reduction Plan

Each Railway Undertaking that operates diesel traction or diesel multiple units should have a Diesel Engine Idling Reduction Plan. The plan should prioritise actions to eliminate diesel engine idling wherever possible and, if this is not possible, introduce time or fleet-bound mitigating measures to reduce the time that diesel engines spend idling.

The plan should identify those locations that are sensitive to either poor air quality or engine noise and where diesel engine idling takes place. Such locations could be:

- i. Stations in densely populated areas of towns or cities and where the stations are more enclosed;
- ii. Depots in which staff are situated, or in residential areas;
- iii. Sidings in residential areas; or
- iv. Freight yards.

The plan should set out the extent of diesel engine idling at these locations and the reasons for it, such



reasons may be categorised as:

- i. Short train turnaround time;
- ii. Provision of train air and electricity supplies;
- iii. Timetable stop for train crew changeover;
- iv. Bringing diesel trains up to service readiness on depot, at terminal stations, or in sidings; or
- v. Other reasons as appropriate.

The plan should be risk based and therefore should focus on reducing diesel engine idling times within the sensitive locations identified within the plan. Locations that are identified as the most sensitive should be regarded as locations where a change to current practice or the introduction of technological solutions should be sought.

Diesel Engine Idling Plans should be in place by 1 April 2022.

## 2.2 Maintenance depots

Depots have the potential to be both noisy and to produce locally poor air quality and as such several control measures should be considered when developing the Diesel Engine Idling Reduction Plan:

- i. All diesel engines on the depot should be shut down on arrival except if the train or locomotive is required for immediate maintenance and the depot driver or train driver is expected to be instructed to take the train or locomotive to a specific location within a short period of time, or has been reported prior to arrival on depot with a fault which would be potentially exacerbated by shutting the engine(s) down. The diesel engines should be shut down once the train or locomotive arrives at the specific location unless the engines are required to run for the maintenance activity.
- ii. Movements within a depot should always be a slow speed and therefore railway undertakings should advise train drivers to make moves within a depot on a reduced number of engines and not to excessively accelerate when entering or leaving the depot.
- iii. To reduce the need for diesel engine idling, an assessment of the depot facilities should take place including the provision, or otherwise of appropriately located and specified shore to train supplies, compressed air supplies, and battery chargers.
- iv. If it is not possible to utilise a shore supply or equivalent and if the diesel engines are required to idle for some time, then an assessment of possible locations for subsequent designation for such idling should take place. These locations, where possible, should ideally be away from where staff are regularly work and, where possible, as far away from railway neighbours as possible, or locations where there is better ventilation, including mechanical exhaust extraction systems.
- v. The Depot Manager should make sure that diesel engines are shut down when they are not in use.
- vi. When there are movements into or out of buildings, or when specialised equipment is being used, such as wheel lathes, it is important that the staff working in these environments are protected from the pollutants emanating from running diesel engines. Railway undertakings should consider the use of battery powered tugs to undertake such moves. If a battery powered tug is not considered necessary, then a risk assessment should be undertaken to identify specific control measures that can be put in place in these to control the risk of staff breathing in pollutants.
- vii. Diesel engines on multiple units or locomotives that are on depot and awaiting to depart for the main line or a station should not be started earlier than necessary to meet its departure time. At freight yards this time may include time for train marshalling to be carried out prior to time of departure.
- viii. It is recommended that Compressor Speed Up Systems are not normally used within a depot as, although they reduce the time to build air up in the system, they increase noise and

pollution within the depot.

- ix. Consider undertaking technical modifications such as ‘older DMUs’ by turning the run on timer relay to zero minutes
- x. To only use ‘Webastos’ engine preheat where blocks or the coolant temperature drop below the requirements in the manual. Duty holders should consider isolating Webastos in Scotland in summer and removed from all English and Welsh fleets.

## 2.3 Station working

Control measures should be considered for introduction at stations to reduce diesel idling such as:

- i. Diesel Engines on trains or locomotives should be shut down on arrival at stations unless the timetable requires the train or locomotive to continue its journey or to commence a new journey within a short time period. The diesel engines should be restarted in such time to enable trains to depart on time and to provide a welcoming environment for passengers and to allow station duties to be performed.
- ii. An assessment of the station facilities should take place to identify existing and potential for new or relocated shore supplies (electrical and compressed air), improved mechanical ventilation systems and battery chargers for example. These facilities should consider the impacts of having diesel engines shut down such as on tail lamps, air conditioning systems and door control systems and look for ways of mitigating these. This could be by the provision of battery tail lamps or mobile air conditioning units for example. The stopping positions of trains should be reviewed to minimise the extent that diesel engine idling takes place in enclosed areas.
- iii. During times of weather that leads to excessive heat or cold, it may be necessary for engine idling times to be extended. In these cases, designated locations within the station should ideally be identified for where diesel idling can take place. These designated locations should ideally be away from staff and ideally as far away as possible from railway neighbours.
- iv. Diesel engines of multiple unit type trains should ideally be started up no earlier than the time required for a prompt departure, unless there are technical constraints that mitigate against this. For locomotive hauled trains, the Fleet Manager should assess the minimum time required for starting up the diesel engines for the type of train being hauled.
- v. Railway Undertakings should work with the Infrastructure Owner to explore ventilation systems that could be specified and fitted (such as that installed at Birmingham New Street) at those stations jointly identified as requiring radical solutions. Radical solution could be required at those locations that are identified as sensitive within the Diesel Engine Idling Reduction Plan.
- vi. It is recommended that Compressor Speed Up Systems are not normally used within a depot as, although they reduce the time to build air up in the system, they increase noise and pollution within the station.

## 2.4 Freight working

For railway undertakings operating freight trains, noise and air quality challenges are apparent when diesel engine idling takes place at depots, yards and sidings.

The following control measures are proposed as suggestions for railway undertakings operating freight trains to aid in reducing the amount of time that diesel engines are idling:

- i. Diesel engines on light locomotives that are required to marshal a train should be started up no earlier than the time necessary so that it can be driven when the first movement is authorised.
- ii. For diesel engines on locomotives of trains already marshalled, the Fleet Manager should

- assess the minimum time required for starting up the diesel engines for the type of train being hauled. This assessment should be based upon the timing load of the train.
- iii. Designated locations within freight yards should be identified for where diesel idling anticipated for longer than average periods should ideally take place. These designated locations should ideally be away from staff and ideally as far away as possible from railway neighbours.
- iv. The Fleet Manager should explore the practicality and business case for funding provision of auxiliary engines to reduce the reliance on the locomotive's main diesel engines. It is accepted that on some locomotives and on some routes, this may not be a technically viable proposition.
- v. Freight railway undertakings should work with Network Rail to reduce the time freight locomotives are stood with engines idling in loops and sidings awaiting access to the main line to continue their journeys.

## 2.5 Operations and train driver behaviour

It is understood that any changes to the timetable to reduce the occurrences of diesel engines idling will require cooperation from the Infrastructure Manager and may also require agreement from service specifiers/funders. However, railway undertakings should strive to design their timetables to reduce the occurrences of diesel engine idling. Other operational measures should be considered such as communications campaign to train drivers exhorting train drivers to reduce diesel engine idling time or locally determined guidance on diesel engine idling. Timetabling and other operational control measures to be considered could be:

- i. Reducing or extending the time that the train is at a station as appropriate. Reducing the time may lead to less diesel idling, whilst increasing the time may allow for the opportunity for diesel engines to be shut down.
- ii. Trains coming off depot should ideally arrive a short time before departure from the station. Some special trains and sleeper trains would require more station time. This would enable diesel engine idling to take place at locations other than at stations and potentially away from railway neighbours. This measure relies on the provision of available infrastructure and pathways into the station.
- iii. Assessment of the provision, or otherwise, of signs, instructions, and local arrangements. Railway undertakings should determine if their signage is adequate at those locations identified in its Diesel Engine Idling Reduction Plan. Railway Undertakings should request Network Rail to provide uniform advice within their Sectional Appendices of those locations identified in the Diesel Engine Idling Reduction Plan.
- iv. As a generic rule, permission should be sought from the railway undertaking's Fleet and Operational Control prior to extending diesel idling times.
- v. The Fleet Management function should provide a briefing to train drivers on the diesel engine idling requirements of the diesel rolling stock they are expected to drive. This briefing should cover the time required to provide passenger and staff comfort requirements, as well as train reliability issues surrounding shutting the engines down.

## 2.6 Monitoring of the Diesel Engine Idling Reduction Plan

Railway Undertakings should monitor the extent of diesel engine idling and compliance to its own Diesel Engine Idling Reduction Plan with senior ownership within the business. Reporting should be undertaken on a regular basis, reporting to Board level and for taking action to improve compliance.

Adherence to this Guidance Note may be recorded using observational or OTDR data.

All defects to rolling stock which cause vehicle noise or emission pollutant should be reported to the maintenance control supplier as defined within business specific instructions.



All Drivers, both mainline and depot, should be assessed and monitored as part of their CMS cycle to ensure compliance with the relevant standards for engine idle and shut down procedures for all traction types operated.

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