

# APPLICATION TO VARY ENVIRONMENTAL PERMIT REFERENCE EPR/BN7109IH

Meggitt Aerospace Limited

Supporting Information Document

JER8395  
Application to Vary  
Environmental Permit  
EPR/BN7109IH  
3  
2  
28 February 2023

## Quality Management

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# NON-TECHNICAL SUMMARY

## Introduction

The current manufacturing activities at the Meggitt Aerospace Limited (MAL) facility in Coventry are regulated under a bespoke environmental permit (EPR/BN7109IH) which allows the production of brake discs for aircraft through the vapour deposition of carbon through the cracking of natural gas or other hydrocarbons onto material formers.

The company undertakes the following activities which fall under the Environmental Permitting (England and Wales) Regulations 2016 (EPR) as follows:

- Section 1.2 Part A(1)(f) - Activities involving carbonisation of carbonaceous minerals
- Section 6.2 A (1) (a) - Producing carbon by means of graphitisation

In addition to the main activity, the following directly associated activities (DAAs) are carried out at the site:

- Steam generation
- Thermal oxidiser abatement plant
- Propane storage and use
- LNG storage and distribution system
- Cooling system

This application to vary an environmental permit has been prepared by RPS on behalf of the Operator, MAL, in accordance with the requirements of the Environmental Permitting (England and Wales) Regulations 2016 (as amended).

## Description of Changes

This application seeks to vary the environmental permit to increase the production capacity at the facility by 25,550 discs per year taking total annual production capacity to 48,000 discs. In order to achieve this increase in production, the following changes and improvements at the site are being made:

- Install four electrically powered high temperature furnaces;
- install an electrically powered controlled atmosphere elevator furnace;
- install two spray booths for the antioxidant coating;
- move the dust control extraction units to another area of the site;
- install additional dust control exaction units to the machining area of the site; and
- install an argon tank for storing gas to be used with the new furnaces.

## Variation Application

A full description of all operations is provided within the application. Application forms can be found in Appendix A. Site plans and layouts can be found in Appendix B.

An environmental risk assessment (ERA) (Appendix C) has been carried out to assess the potential impacts of odour, noise and vibration, fugitive emissions, visible plumes, and accidents ranges. These impacts have been assessed and range from ~~not significant~~to ~~low~~q

A H1 assessment has been carried out in order to assess the potential impacts of the emissions to air from the new equipment. This has concluded that the emissions screen out as insignificant.

As there is additional land being included in the permit boundary, an update to the site condition report (SCR) provides a coherent record of the site and its baseline conditions at the time of permitting. An

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assessment of new relevant hazardous substances used, produced and emitted by the facility has been carried out and can be found with the site condition report at Appendix D.

The site environmental management system (EMS) will be updated to include the new equipment introduced at the site and the subject of this variation application.

In summary the proposed facility has been designed and will be operated to ensure that significant impacts to the environment and human health do not arise as a result of its operation. The main plant will operate techniques that are proven and reliable and are concluded to represent Best Available Techniques (BAT).

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Appendix F Process Flow Diagram

Appendix G Meggitt Procedures & Work Instructions

Appendix H Technical Specifications

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# 1 INTRODUCTION

## 1.1 Background

- 1.1.1 This document and its supporting appendices form the application to vary the environmental permit (reference EPR/ BN7109IH) for the Meggitt Aerospace Limited (MAL) facility in Coventry.
- 1.1.2 MAL is permitted for the manufacture of brake discs for aircraft through the vapour deposition of carbon through the cracking of natural gas or other hydrocarbons onto material formers. The process takes oxidised polyacrylonitrile (OPAN) fibre and converts it into a carbon fibre through mechanical and heat treatment. The fibre is converted to disc shaped formers for the disc production through cutting to the required shape. The carbon formers are then turned into carbon discs through the vapour deposition of carbon onto the fibre formers in furnaces, utilising natural gas and other hydrocarbons. They are then heat treated, converting the carbon structures into graphite before finishing processes such as machining are undertaken. The processes operate on a batch basis. Finished discs are painted with antioxidant paint before dispatch.
- 1.1.3 The site activities are captured under the requirements of the Environmental Permitting (England and Wales) Regulations 2016 (EPR) as follows:
- Section 1.2 Part A(1)(f) - Activities involving carbonisation of carbonaceous minerals
  - Section 6.2 A (1) (a) - Producing carbon by means of graphitisation
- 1.1.4 A variation to the environmental permit (section 6.2 A (1) (a) activity) is now required as MAL are looking to increase the production capacity by 25,550 discs per year by installing four electrically powered high temperature furnaces, an electrically powered oven, an additional two spray booths and dust extraction systems for the machining room. The Consarc Nu-Carb furnaces will require argon gas and therefore an argon gas storage tank is also to be installed. Following this variation the facility will have the capacity to produce 48,000 discs per annum.
- 1.1.5 In order to accommodate the new plant, an additional area of land/buildings will be utilised within the process, as a result of this the permit boundary will increase.

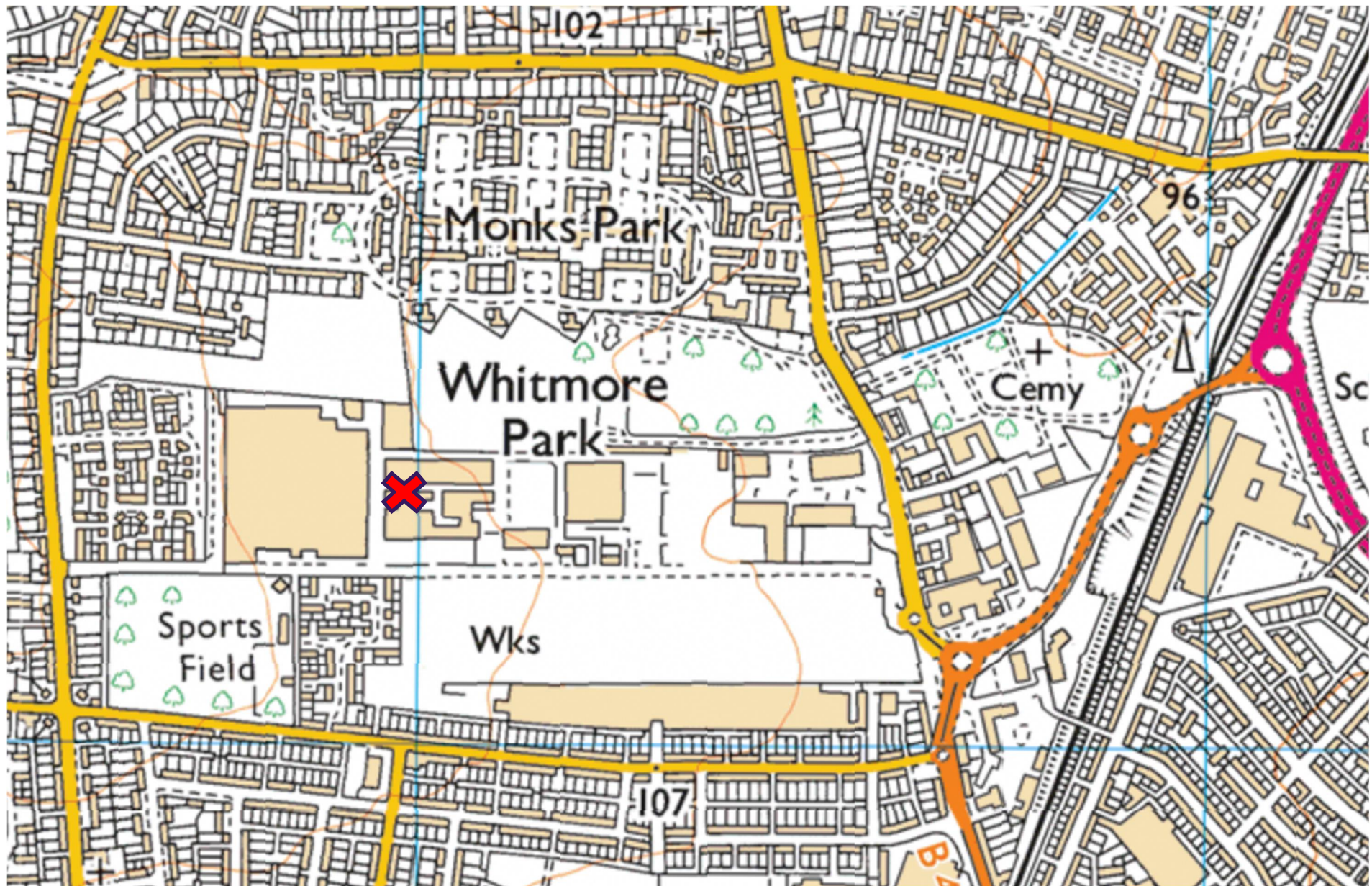
## 1.2 The Site

- 1.2.1 The site is located at Holbrook Lane, Holbrook, Coventry, West Midlands, CV6 4AA approximately 3km to the north of Coventry city centre. The site is centred at the approximate national grid reference SP 3303 8233 and is surrounded by housing and industrial estates.
- 1.2.2 The approximate location of the site is highlighted by the red X in the map in Figure 1.1 and 1.2 below.
- 1.2.3 The site address is:
- Meggitt Aerospace Limited  
Carbon Brake Facility, Coventry  
Holbrook Lane  
Coventry  
Warwickshire  
CV6 4AA
- 1.2.4 The National Grid Reference (NGR) for the facility is ~ NGR SP 3303 8233.

Figure 1-1: Site Location (Wider Area)



Figure 1-2: Site Location (Local Area)



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1.2.5 Site layout plans can be found in Appendix B.

## **1.3 Operator Details**

1.3.1 MAL is listed on Companies House as company number 03477890. The registered company office is at Atlantic House Aviation Park West, Bournemouth International Airport, Christchurch, Dorset, England, BH23 6EW. The company was incorporated on 9 December 1997.

1.3.2 The Company Directors as listed on Companies House and their dates of birth are provided in Appendix I.

## **1.4 Structure of the Application Document**

1.4.1 Supporting information in this document is set out as follows:

- Section 2 provides an overview of the operations and the proposed changes to the activities that necessitate this permit variation
- Section 3 identifies the environmental management systems in place at the site
- Section 4 provides the detailed operating techniques for the activities
- Section 5 identifies the environmental risks and summarises the environmental effects associated with the activities
- Section 6 provides the BAT justification for the main techniques and describes how they comply with BAT conclusions.

1.4.2 Other supporting information is provided in Appendices including the completed Environment Agency (EA) application forms (Part A, C2, C3 and F1 forms).

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## 2 DESCRIPTION OF THE CHANGES

### 2.1 Overview

- 2.1.1 The proposed changes included within this variation are described in this section. All other aspects of the permitted operations and management will remain as are currently permitted unless identified below.
- 2.1.2 As part of process improvements and to increase manufacturing capacity, the following changes are to be made:
- install two spray booths for the antioxidant coating;
  - install four Consarc Nu-Carb electrically powered high temperature furnaces;
  - install an electrically powered controlled atmosphere elevator (SECO) furnace;
  - install additional dust control extraction units to the machining area of the site; and
  - install an argon tank for storing gas to be used with the new furnaces;
- 2.1.3 A new building is being constructed to house the new furnaces, oven, spray booths and dust extraction systems. The argon tank will be located externally. This area is not currently within the permitted site boundary and will therefore require the permit boundary to be changed to incorporate this new area.
- 2.1.4 A site layout plan showing the locations of the new plant can be found in Appendix B.
- 2.1.5 A Process Flow Diagram (PFD) can be seen in Appendix F showing how the new plant links into the existing process at the site.

### 2.2 Antioxidant Coating Spray Booths

- 2.2.1 In an adjacent building commonly called the 'old garage' there will be 3 spray booths for the application of antioxidant paint and five paint curing ovens (3 x Almor air re-circulating ovens, 1 x Almor 'walk in' curing oven and a large oven used for primer curing). Only the primer curing oven will have any emissions to air.
- 2.2.2 Three dry filter spray booths for spray coating brake discs using an antioxidant paint are to be installed. Details on the spray booths specification can be found in the technical specifications in Appendix H.
- 2.2.3 Air from the spray booths will be extracted by means of a single 3,000 mm wide expansion chamber. Air will be drawn through a filter at the back of the working depth, by one off belt driven axial flow type fan, for discharge to atmosphere. The extract fan has been rated to provide airflow of 0.7 m/s through the booth.
- 2.2.4 The filter will be 2 stage fibre glass filter and synthetic final filter. Spray booth filters are fitted inside of the spray booth enclosures so prior to extraction.
- 2.2.5 Sample port for monitoring of emissions from the spray booths will be installed. The sampling point will be situated on the stack.
- 2.2.6 The location of the proposed spray booths can be seen in the site plan in Appendix B.

### 2.3 Consarc Nu-Carb Furnaces

- 2.3.1 A new extension to the CVD building will be constructed, this will house four 8-ft vacuum and atmospheric heat treatment furnaces (high temperature furnaces), these are electrically powered furnaces (600kW power supply) designed to inductively heat the charge under either vacuum to 2,600°C or under atmospheric pressure with inert gas to 2,900°C (argon or nitrogen). The furnaces

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will be used to heat pre-treat either preforms or dense carbon parts. Carbon preforms will undergo pre-heat treatment of the carbon fibre during which some graphitisation will occur, there are no reaction off-gases which require treatment or abatement, just the heating of the carbon preforms to a temperature under inert gas atmosphere to prevent oxidation.

- 2.3.2 The furnaces and the emission points will be paired i.e. they will share a common release point. Each pair of furnaces will share a power supply; a 600kVA induction unit which heats one furnace at a time. While one furnace from each pair is being loaded/unloaded its partner will be operational. The furnaces have an operational cycle that typically comprises a 19-24 hr heating phase followed by a 2-3-day cooling phase with each operational cycle. Each furnace has its own induction heating coil plus controls, water, cooling and vacuum subsystems. The furnace vessel will be surrounded with insulation for improved energy efficiency and a top layer of rigid graphite felt is fitted to prevent blowing of the insulation powder during gas cooling.
- 2.3.3 The vacuum subsystem will comprise the following components:
- Dedicated filter;
  - Oil mist eliminator;
  - Automatic pump isolation valve;
  - Leak checking; and
  - Vacuum pump control to include oil mist eliminator high backpressure alarm, high oil temperature alarm and low internal oil pressure alarm.
- 2.3.4 Cooling water distribution system supplies cooling water from the currently installed cooling towers at the site to areas if the vacuum furnace system exposed to thermal radiation, such as the vessel sections, bases and penetrations. The furnace is supplied with two separate water-cooling loops.
- 2.3.5 In addition to the furnaces, 2 No. closed circuit cooler towers will also be installed. These will provide a flowrate of 420 l/min of water to each furnace giving a heat rejection per furnace of 967 kW. Further details on the additional cooler towers can be found in Appendix H.
- 2.3.6 Further details on the furnace specifications can be found in the technical specifications in Appendix H.
- 2.3.7 Emissions from the new furnaces will be via 2 No. stacks at roof level. Sample ports for monitoring of emissions from each of the furnaces will be installed in its associated stack. These are to be added to the current emissions points from the site.
- 2.3.8 As the furnaces are not running as a vacuum process, all the oxygen has to be displaced to prevent oxidation of the preforms (most easily damaged), the near finished discs and also to protect the furnace furniture. Emissions will either be of nitrogen or argon dependant on the heating stage as follows:
- Nitrogen: this gas is inert with regard to carbon and used up to 2,000°C, but after that it can undergo side reactions with carbon that damage the mechanical properties of the fibres in the preform. If this happens the mechanical properties of the whole composite disc is compromised.
- 2.3.9 Argon: To avoid damage to the preform, argon is used at temperatures above 2,000°C. The location of the proposed furnaces can be seen in the site plan in Appendix B.
- 2.3.10 In addition, the new extension will house a fibrevac machine (415VAD/100A power supply) and a needle press (415VAC/100A power supply) for the production of carbon fibre preforms. Also present will be 2 small presses which form part of the preform production process and 2 x fibre drying ovens (415VAC/100A power supply).

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## 2.4 SECO/WARWICK Controlled Atmosphere Elevator Furnace

- 2.4.1 A controlled atmosphere elevator furnace oven (heat processing furnace system) used for primer curing is to be installed. This is to be used for primer curing items following application of paint in the new spray booths.
- 2.4.2 The furnace will be of similar construction/function to the elevator furnace already installed. The oven will have the following:
- Control logic for heating will be proportional control to allow for smoother heat up and control using silicon-controlled rectifiers (SCR) type control for the heating power;
  - The diffuser will be modified for better convective gas recirculation, which in combination with the better heating control will further add to the better uniformity;
  - The furnace will be designed, as requested, to Conformité Européene (CE) standards; and
  - The movable car will allow elimination of the pit for loading.
- 2.4.3 The maximum operating temperature will be 850°C. The furnace will be electrically heated using a 132 kW rated heating element.
- 2.4.4 The location of the proposed oven can be seen in the site plan JER8395-PER-003\_D\_200409\_EmissionPoints\_V2 and WE3260 PPC drawing 2 in Appendix B.
- 2.4.5 Further details on the oven specifications can be found in the technical specifications in Appendix H.

## 2.5 Dust Control Extraction Units

- 2.5.1 Five new Donaldson dust extraction/collection systems for the machining/cutting process will be installed. These units contain fibre cartridge filters to remove dust from the extracted air prior to emission to atmosphere. The system has an automated collector cleaning pulse system to allow dust to be easily collected and removed for recovery or disposal and allow for longer use of the filter system.
- 2.5.2 The dust collection system will collect the dust from the final machining (stage 13) as shown in the process flow slides in **Appendix F**.
- 2.5.3 Sample ports for monitoring of emissions from the dust extraction systems will be installed.
- 2.5.4 The location of the proposed dust extraction systems can be seen in the site plan JER8395-PER-003\_D\_200409\_EmissionPoints\_V2 and WE3260 PPC drawing 2 in Appendix B.
- 2.5.5 Further details on the dust extraction systems specification can be found in the technical specifications in Appendix H.

## 2.6 Argon Tank

- 2.6.1 Argon gas is used in the Consarc Nu-Carb furnaces where it will be used as a blanket gas for temperatures above 2,000°C as detailed in paragraph 2.3.8 above.
- 2.6.2 Argon will be stored in a cryogenic storage tank with a storage capacity for 11,000 litres of liquid argon. In addition to the tank, the following will be installed:
- Two ambient vaporisers which consist of long pipes with fins attached to improve heat transfer to convert liquid to gas at a nominal 10°C below prevailing ambient conditions. There is no need for power of any kind because the outside atmosphere is so much warmer than the stored gas (even on a cold day).
  - Vaporiser auto changeover manifold. After a number of hours (perhaps 4-6hrs) so much ice builds up on the outside of the vaporiser (water from the atmosphere) that the performance of

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the device falls off considerably. Its therefore important to have the facility to switch to a completely ice free vaporiser while the other one thaws out. Switching will be controlled by the temperature of the argon on the output side of the vaporiser via a single phase 230 volt supply control unit included as part of the set-up;

- Pressure and temperature control equipment; and
- Low temperature alarm system

2.6.3 The location of the proposed argon tank can be seen in the site plan in Emissions points 24022020 in **Appendix B**.

2.6.4 Further details on the argon tank specification can be found in the technical specifications in Appendix H.

## 2.7 Additional areas included in permitted site boundary

2.7.1 The proposed changes to the site operation will require a change in the permitted area and permit boundary to incorporate the new plant etc. An updated permit boundary plan is shown on plan JER8395-PER-001\_D\_200225\_PermitBoundary in Appendix B. The new permitted area is located to the south of the existing CVD building.

2.7.2 The site condition report has been updated to incorporate the new area and this can be found in Appendix E.

## 2.8 Additional Emission Points

2.8.1 There will be nine new emission points to air as part of the proposed variation as shown on plans JER8395-PER-003\_D\_200409\_EmissionPoints\_V2 and WE3260 PPC drawing 2 in **Appendix B**. These will be as follows:

- A31 DMG Dust Extractors
- A32 DMG Dust Extractors
- A33 DMG Dust Extractors
- A34 DMG Dust Extractors
- A35 DMG Dust Extractors
- A36 Spray Booth Extraction
- A37 SECO Oven
- A38 Nu Carb Furnaces
- A39 Nu Carb Furnaces

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## 3 MANAGEMENT OF ACTIVITIES

### 3.1 General

- 3.1.1 MAL operates an Environmental Management System (EMS) which is certified and complies with the requirements of ISO14001.
- 3.1.2 MAL is committed to the prevention of pollution, the protection of the environment and the health and safety of its employees, customers, and neighbours. To this end, the following principles will govern practices in the design, manufacture, distribution, maintenance and disposal of products and related services.
- Protect the environment and the health and safety of our employees, customers, and the community in which we operate from unacceptable risk
  - Conduct operations and manufacture products that are in compliance with all applicable regulatory and other requirements and MAL standards
  - Reduce where possible, the consumption of natural resources, generation of waste, and emissions of harmful substances to the environment
  - Continuous advancement in the effectiveness of our EMS through the setting and reviewing of improvement goals and objectives, measurable targets, plans to achieve these goals, and by implementing and auditing the system for improvement
  - Communication of our policy, goals, objectives, and progress to the public upon request, and to all levels within the organization thus, raising the awareness of our associates and allowing them to carry out their environmental responsibilities effectively
- 3.1.3 The management system has defined procedures for operating the plant effectively and in compliance with the environmental permit, these will be updated to include the new plant. Planned maintenance routines have been established to ensure all key plant components remain in good working order. All newly installed plant detailed in this application will be incorporated into the planned maintenance and inspection plans.
- 3.1.4 The facility is managed and operated by a technically competent and trained workforce. Clear lines of responsibility are established, and these are defined within the management system. Staff will receive training on newly installed plant and equipment, procedures and use/hazards of raw materials. Staff training records are available for review as required
- 3.1.5 Prior to the commissioning process for the new plant and equipment, management systems and procedures will be reviewed and updated; and an assessment of the potential impacts of use of the new plant and equipment will be undertaken. Updated management systems will be available for review as required. All the new plant and equipment will have separate instructions prepared and issued to ensure strictly defined and safe working procedures are adhered to.

### 3.2 Accident Management

- 3.2.1 As part of the management system review prior to commissioning, the accident management plan (AMP) will be reviewed and updated if required. This document identifies foreseeable accidents and assesses the likely risk posed to the environment accounting for the management procedures which are in place. The procedures to follow in the event of an incident will also be reviewed and updated. The updated AMP and relevant procedures will be available for review as required.
- 3.2.2 Accident risks have been assessed as part of the environmental risk assessment as detailed in section 4 below. This has concluded that there is no increased risk of accidents as a result of the proposed variation.

- 3.2.3 The AMP will be updated once the variation has been determined and the new plant and equipment is installed and commissioned.

### 3.3 Energy Efficiency

- 3.3.1 The new building will have low energy LED lighting installed with daylight sensors, energy metering and an Energy Performance Certificate (EPC).
- 3.3.2 The new furnaces, ovens, spray booths and dust extraction systems will increase the overall energy consumption of the site, however, as this will increase the overall production capacity of the site, the energy usage per unit product will be similar to the current production. The overall electricity increase will be approximately 26,280 MWh giving an annual usage of ~ 26,595 MWh.
- 3.3.3 It is proposed that once new plant is installed and commissioned, an energy efficiency audit and survey be carried out after a period of operation in order to assess the energy efficiency of the new plant and site as a whole.

### 3.4 Efficient Use of Raw Materials and Water

- 3.4.1 The following changes to the raw materials used and stored at the site are as follows:

**Table 3.1: Types and Amounts of Raw Materials**

Installation name – Meggitt Aircraft Braking Systems				
Schedule 1 Activity	Description of raw material and composition	Maximum amount (tonnes)	Annual Usage	Use of the Raw Material
Section 6.2 A (1) (a)	Oxidised polyacrylonitrile cloth.	~100	~150 tonnes	Manufacture of Carbon Fibre cloth in Carbonising furnace.
	Nitrogen gas	30 tonnes	Approx. 423,108 m <sup>3</sup>	Heat treatment of carbonised cloth
	Argon gas	30 tonnes	Approx. 423,108 m <sup>3</sup>	
	Antioxidant spray coating	~500 litres	~2,000 litres	

- 3.4.2 As well as the above raw materials, the following materials are used in the cooling waters for Legionella controls / biocides for water treatment. As there will be additional cooling installed, the use of the chemicals will approximately double as detailed in the annual usage below:
- 1.5% CMI/MI (copper stabilised) - 400 litres (16 x 25 litre containers)
  - STREAMLINE 202 (Biocide) . 800 litres (32 x 25 litre containers)
  - STREAMLINE 224 (Biocide) . 10,000 litres (40 x 25 litre containers)
  - STREAMLINE 228 (Biocide) . 5,600 litres . (64 x 25 litre containers & 4 x 1m3 IBCs)
  - STREAMLINE 250 (Biocide) . 400 litres (16 x 25 litre containers)
- 3.4.3 The above chemicals are currently used in the cooling towers on site and will be used in the cooling systems for the new furnaces to be installed. Cooling water treatment chemicals will be stored in locked metal containers within a building and all within a bunded area.
- 3.4.4 Safety Data Sheets (SDS) for the above chemicals are included in Appendix E as part of the site condition report.

### 3.5 Avoidance, Recovery and Disposal of Wastes

- 3.5.1 As part of the EMS, there is a commitment to reduce the generation of waste where possible. Raw materials are used in specific quantities so as to reduce any waste from the process. Waste gases from the furnace are reused in the site boilers along with natural gas. Where possible,

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waste follow the waste hierarchy and if produced will be reused, recovered or recycled with disposal only as a final option where no other options are available.

- 3.5.2 There will be an increase in packaging waste from the additional use of chemicals for cooling as detailed above, however, all other waste streams will remain the same. No packaging is reused on site.

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## 4 ENVIRONMENTAL RISKS AND EFFECTS

### 4.1 Environmental Risk Assessment

- 4.1.1 An Environmental Risk Assessment (ERA) has been carried out including consideration of the new plant (additional furnaces), the new storage areas, new spray booths and argon storage. The ERA considers only the risks from hazards potentially affected by the proposed changes. Other hazards will remain unchanged. The ERA can be found in Appendix C.
- 4.1.2 There are no changes or additions to emissions to water or land as a result of this change.
- 4.1.3 The majority of risks such as vandalism, flooding etc. remain unchanged as a result of the proposed change. This is detailed in the ERA in Appendix C.
- 4.1.4 The results of the ERA have shown that the risk of odour, noise and vibration, fugitive emissions, visible plumes, and accidents ranges from not significant to low.
- 4.1.5 An air quality assessment has been carried out for emissions to air and this has concluded that, with the new stacks, the predicted concentrations associated with operations at the site are below the relevant air quality standards and the effects of the impacts are not considered to be significant.
- 4.1.6 The air quality assessment also included an assessment of odour, this assessment concluded that the odour was not significant overall. The air quality assessment also included an assessment of odour, this assessment concluded that the odour was not significant overall.

### 4.2 Point Source Emissions to Air

- 4.2.1 A total of 9 new emissions to air from the newly installed nu-carb furnaces, SECO oven, machine room dust extraction and paint spray booths. The proposed changes are shown in Table 4.1 below:

**Table 4.1: New Point Source Emissions to Air**

<b>Installation name – Meggitt Aircraft Braking Systems</b>						
<b>Emission point reference</b>	<b>Source</b>	<b>Parameter Limit (including unit)</b>	<b>Limit</b>	<b>Reference period</b>	<b>Monitoring frequency</b>	<b>Monitoring standard or method</b>
A31	DMG Dust Extractors	Total Particulates	No limit set	Extractive sample	Annually	BS EN 15058 or as agreed in writing with the Environment Agency
A32	DMG Dust Extractors	Total Particulates	No limit set	Extractive sample	Annually	BS EN 15058 or as agreed in writing with the Environment Agency
A33	DMG Dust Extractors	Total Particulates	No limit set	Extractive sample	Annually	BS EN 15058 or as agreed in writing with the Environment Agency
A34	DMG Dust Extractors	Total Particulates	No limit set	Extractive sample	Annually	BS EN 15058 or as agreed in writing with the Environment Agency
A35	DMG Dust Extractors	Total Particulates	No limit set	Extractive sample	Annually	BS EN 15058 or as agreed in writing with the Environment Agency
A36	Spray Booth Extraction	No parameter set	-	-	-	-
A37	SECO Oven	Acetic Acid	TBC	Extractive sample	Annually	TBC
		Phosphoric acid	TBC	Extractive sample	Annually	TBC
A38	Nu Carb Furnaces	No parameter set	-	-	-	-
A39	Nu Carb Furnaces	No parameter set	-	-	-	-

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- 4.2.2 Further assessments of emissions to air have been considered in the H1 assessment which can be found in Appendix C. The conclusions from the H1 assessment show that some pollutants (nitrogen oxides and particulates) were not screened out as insignificant and therefore further assessment was needed. An air quality assessment has been undertaken and can be found in **Appendix D**.

### 4.3 Point Source Emissions to Water and Sewer

- 4.3.1 There are no changes to the currently listed emissions to water and sewer. There will be no new point source emissions to water and sewer as a result of the proposed changes to the facility.

### 4.4 Point Source Emissions to Land

- 4.4.1 There are currently no point source emissions to land from the installation and there will be no new point source emissions to land as a result of the proposed changes to the installation.

### 4.5 Fugitive Emissions to Air, Land, Water and Sewer

- 4.5.1 Impacts for odour, noise, raw materials storage has been considered in the Environmental Risk Assessment in Appendix C. The ERA demonstrates that there will be no significant impacts as a result of the proposed variation with minimal risk of fugitive emissions such as noise and odour from the new plant and additional chemical usage.

### 4.6 Odour

- 4.6.1 The proposed changes to the installation do not include the use or storage of any materials identified as having the potential to generate odour and cause off-site odour nuisance. An assessment of odour risks is included in the ERA in **Appendix C**. This has concluded that odour risks from the installation are low. The air quality assessment (**Appendix D**) also included an assessment of odour, this assessment concluded that the odour was not significant overall.

### 4.7 Noise

- 4.7.1 MAL has a noise management plan in place as part of the site EMS. This details the following control measures:
- All plant and equipment are fitted with appropriate noise suppression equipment.
  - All plant operatives have been appropriately trained in noise reduction techniques through the proper use of machinery and regular plant inspection within the installation.
  - All high noise level areas are demarcated with hearing protection zones with appropriate hearing protection supplied to plant personnel.
  - All plant and equipment are visually checked periodically with reactive maintenance employed if required.
  - Maintenance and inspection of all plant and machinery is undertaken periodically and recorded.
  - Any complaints and non-conformances are investigated and recorded.
  - Following complaints, the source of any excessive noise will be identified, investigated and remedial action undertaken either through working practices or machine controls.
  - Noise levels are monitored periodically to ensure noise generated as a result of production operations does not disturb local residents and site personnel and that operational health and safety guidelines are complied with.

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- Monitoring will be undertaken periodically or in response to any working practice/machinery changes or complaints. All monitoring will be recorded.

- 4.7.2 A noise assessment was undertaken as part of the previous variation application which deemed the previously installed cooling systems as acceptable. The cooling towers proposed as part of this variation are 11 dB quieter than the other BAC cooling towers assessed (84 compared to 95 dBA LW) and are located further away from sensitive receptors therefore no further noise assessment has been proposed. The manufacturer is including whisper fans as part of the cooling tower setup. Technical specifications can be found in Appendix H.
- 4.7.3 No additional noise management measures are proposed as part of this variation and those detailed in the noise management plan included in Appendix C remain appropriate for the facility,
- 4.7.4 It is concluded that there will be no significant increase in noise from the site as a result of this proposal.

## **4.8 Monitoring and Reporting of Emissions (Air, Water and Sewer)**

- 4.8.1 Emerson DeltaV<sup>1</sup> will be used to monitor all the major pieces of equipment. The Emerson DeltaV is a computer software system that allows automatic monitoring of process parameters such as temperature, pressure and other control measures.
- 4.8.2 CCTV will be used in all areas and all high temperature equipment will be monitored in person for at least the first 6 months of operation.
- 4.8.3 Monitoring of the new emissions points to air will be incorporated into the EMS monitoring programme. The recent permit variation included a number of improvement conditions relating to monitoring of emissions and it is anticipated that the new plant and emissions will be included with the outcomes of these improvement condition items to establish and update the site wide emissions monitoring programme.

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<sup>1</sup> <https://www.emerson.com/en-gb/automation/deltav>

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## 5 BEST AVAILABLE TECHNIQUES ASSESSMENT

5.1.1 There are three sector guidance notes relevant to the MAL activities as follows:

- Section 1.2 Part A(1)(f) - Activities involving Carbonisation of Carbonaceous minerals:
  - How to comply with your environmental permit - Additional guidance for Gasification, Liquefaction and Refining Installations. (EPR 1.02<sup>2</sup>);
- Section 6.2 A (1) (a) - Producing Carbon by means of Graphitisation:
  - How to comply with your environmental permit - Additional guidance for Non-Ferrous Metals and the Production of Carbon and Graphite (EPR 2.03<sup>3</sup>)
  - Best available techniques (BAT) conclusions for the non-ferrous metals industries<sup>4</sup>

5.1.2 This section contains a review against the BAT requirements detailed in Best available techniques (BAT) conclusions for the non-ferrous metals industries and EA guidance document How to comply with your environmental permit - Additional guidance for Non-Ferrous Metals and the Production of Carbon and Graphite (EPR 2.03).

5.1.3 There are no changes to the Section 1.2 Part A(1)(f) activity as part of this variation, therefore, no BAT assessment has been carried out and all previously submitted BAT assessments remain relevant for this activity.

5.1.4 The BAT assessment only takes into account changes in operations due to the installation of new plant etc. as detailed in this variation. All current operations and activities have been assessed against BAT requirements as part of the original permit application or subsequent variations.

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<sup>2</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/298028/geho0209bpiw-e-e.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/298028/geho0209bpiw-e-e.pdf)

<sup>3</sup> [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/298029/geho0209bpir-e-e.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/298029/geho0209bpir-e-e.pdf)

<sup>4</sup> <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016D1032&from=EN>

5.2 BAT Conclusions - Non - Ferrous Metals Industries

Table 5.1 Assessment of Indicative BAT

BAT Requirements	Operator Evidence of Compliance
Environmental management systems (EMS)	
BAT 1 - 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 listed features:	MAL operates an Environmental Management System (EMS) which is certified and complies with the requirements of ISO14001. The site EMS will be updated prior to commissioning and extend to the new plant. <b>Compliant with the BAT requirements.</b>
Energy Management	
BAT 2 - In order to use energy efficiently, BAT is to use a combination of the techniques detailed in the BAT Conclusions	<b>BAT 2a:</b> The site does not operate under a specific energy efficiency management system; however, energy efficiency measures are included in the ISO 14001 EMS. It is proposed that once new plant is installed and commissioned, an energy efficiency audit and survey be carried out after a period of operation in order to assess the energy efficiency of the new plant and site as a whole. <b>BAT 2b:</b> The furnaces in use at the site are electrically powered due to the requirement for inert atmosphere in the process therefore BAT requirements for re-circulation of combustion gases is not applicable. <b>BAT 2c – BAT 2m:</b> These are not applicable for the changes detailed in this permit variation <b>BAT 2m:</b> The cooling towers have high efficiency motors and all the new equipment will have all modern and efficient equipment. <b>BAT 2o:</b> Extraction systems will be activated whenever operations are undertaken and have been assessed as being at an extraction rate suitable for the operations therefore no adjustment is required. <b>Compliant with the BAT requirements. TBC</b>
Process control	
BAT 3 - In order to improve overall environmental performance, BAT is to ensure stable process operation by using a process control system together with a combination of the techniques detailed in the BAT Conclusions	<b>BAT 3a – 3f:</b> The Emerson DeltaV will be used to monitor all the major pieces of equipment. The Emerson DeltaV is a computer software system that allows automatic monitoring of process parameters such as temperature, pressure and other control measures. The aircraft industry is highly regulated with strict quality control protocols for production of aircraft parts; therefore, quality control procedures are in place to ensure accuracy of manufacturing and process parameters to ensure end products meet design specification and quality. <b>BAT 3g – 3k:</b> Not applicable as not undertaken at the facility. <b>Compliant with the BAT requirements</b>
BAT 4 - In order to reduce channelled dust and metal emissions to air, BAT is to apply a maintenance management system which especially addresses the performance of dust abatement systems as part of the environmental management system (see BAT 1)	Dust abatement systems (Donaldson Dust Extraction) are included in the site maintenance procedures and are regularly serviced and maintained following manufacturers recommendations. <b>Compliant with the BAT requirements</b>
Diffuse emissions	
BAT 5. In order to prevent or, where this is not practicable, to reduce diffuse emissions to air and water, BAT is to collect diffuse emissions as much as possible nearest to the source and treat them.	As detailed in the environmental risk assessment, a number of procedures are in place as part of the EMS to minimise the risk of diffuse emissions from the site. This includes emergency response, accident management plan, spillage, materials storage and noise management. <b>Compliant with the BAT requirements.</b>
BAT 6. In order to prevent or, where this is not practicable, to reduce diffuse dust emissions to air, BAT is to set up and implement an action plan on diffuse dust emissions, as part of the environmental management system (see BAT 1), that incorporates the measures detailed in the BAT conclusions.	EMS procedures are in place for actions to be taken during an incident or emergency. If abnormal emissions are identified, the plant would be shut down to minimise any releases. All activities that could result in diffuse dust emissions are carried out within buildings. <b>Compliant with the BAT requirements</b>
BAT 7. In order to prevent diffuse emissions from the storage of raw materials, BAT is to use a combination of the techniques detailed in the BAT conclusions.	<b>BAT 7a:</b> All raw materials are stored within buildings or sealed containers. <b>BAT 7b – 7q:</b> Not applicable as these materials are not used or stored on site. <b>BAT 7r:</b> Surface water drainage systems include oil interceptors. No processes are undertaken externally, good housekeeping procedures are in place to ensure that all storage areas are kept clean and tidy to minimise risk of diffuse dust emissions. In general, raw materials are not considered dusty and dust generation is not considered significant from the site. Gases are stored in pressurised tanks external to the buildings. <b>Compliant with the BAT requirements</b>
BAT 8. In order to prevent diffuse emissions from the handling and transport of raw materials, BAT is to use a combination of the techniques detailed in the BAT conclusions.	Raw materials are stored within buildings or sealed containers with minimum transport distance to areas where to be used. All processes are undertaken within buildings which minimise material transfers between processes. Where possible, intermediates are stored close to the point of use. No complaints have been received for any diffuse emissions from the site. <b>Compliant with the BAT requirements</b>
BAT 9. In order to prevent or, where this is not practicable, to reduce diffuse emissions from metal production, BAT is to optimise the efficiency of off-gas collection and treatment by using a combination of the techniques detailed in the BAT conclusions.	N/A as not a metal production facility.

BAT Requirements	Operator Evidence of Compliance
Monitoring of emissions to air	
BAT 10. BAT is to monitor the stack emissions to air with at least the frequency given 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.	Monitoring is undertaken as required by the environmental permit for hydrogen cyanide, oxides of nitrogen, total particulates, carbon monoxide and class B VOC. The proposed Donaldson dust extraction units are able to achieve particulate emissions of <5 mg/m3 No monitoring is currently undertaken for SO2, Formaldehyde, Phenol or Benzo. (a). Pyrene as these are not formed as part of the process. Monitoring of emissions for new plant to be installed will be included in the site monitoring programme. Compliant with the BAT requirements
BAT 11 – 12	N/A as there are no mercury emissions from the process.
BAT 13 - In order to prevent NOx emissions to air from a pyrometallurgical process, BAT is to use one of the techniques given detailed in the BAT conclusions	Low-NOx burners are used within the thermal oxidiser. No other combustion processes are used within the permitted activities. Furnaces are electrically powered. Compliant with the BAT requirements
Emissions to water, including their monitoring	
BAT 14 - In order to prevent or reduce the generation of wastewater, BAT is to use one or a combination of the techniques detailed in the BAT conclusions	N/A - No water is used within the process and no wastewater is produced requiring disposal from site. Cooling water is mains sourced and is within a closed loop system for the new plant subject to this variation therefore minimum emissions and top up required. Cooling waters are discharged to sewer under the terms of a trade effluent consent. Clean surface water is discharged to surface water via a site interceptor.
BAT 15 - In order to prevent the contamination of water and to reduce emissions to water, BAT is to segregate uncontaminated wastewater streams from wastewater streams requiring treatment.	N/A - No water is used within the process and no wastewater is produced requiring disposal from site. Cooling waters are discharged to sewer under the terms of a trade effluent consent. Clean surface water is discharged to surface water via a site interceptor.
BAT 16 . BAT is to use ISO 5667 for water sampling and to monitor the emissions to water at the point where the emission leaves the installation at least once per month (1) and in accordance with EN standards.	N/A . There are no direct wastewater emissions to sewer. The only emissions are of cooling water and surface water run-off. Discharges to sewer are monitored as required by the trade effluent consent. There are no monitoring requirements in the environmental permit.
BAT 17 - In order to reduce emissions to water, BAT is to treat the leakages from the storage of liquids and the waste water from non-ferrous metals production, including from the washing stage in the Waelz kiln process, and to remove metals and sulphates by using a combination of the techniques detailed in the BAT conclusions	N/A . No wastewater is produced directly from the production process. There is no liquid storage of raw materials directly used within the process.
Noise	
BAT 18. In order to reduce noise emissions, BAT is to use one or a combination of the techniques detailed in the BAT conclusions	BAT 18b - The main production process activities are all carried out within an enclosed building. A noise assessment has been undertaken and noisy plant has been subject to further mitigation techniques such as low noise fans on cooling towers. A comparison of new plant compared to that previously installed has shown that there are no noise impacts from the changes detailed in the variation application. Compliant with the BAT requirements
Odour	
BAT 19. In order to reduce odour emissions, BAT is to use one or a combination of the techniques detailed in the BAT conclusions	BAT 19a – 19b: The main production process activities are all carried out within an enclosed building. An odour assessment has been carried out as part of the permit variation and has concluded that odour impacts from the process are not anticipated based on the raw materials in use and the management and abatement systems in place. The odour assessment is included in the air quality assessment in Appendix D of the main application. Compliant with the BAT requirements
BAT 20 – 176	N/A as BAT specific for metal production industries.
BAT CONCLUSIONS FOR CARBON AND/OR GRAPHITE PRODUCTION	
Air Emissions	
BAT 177. In order to reduce diffuse PAH emissions to air from the storage, handling and transport of liquid pitch, BAT is to use one or a combination of the techniques detailed in the BAT conclusions.	N/A . Liquid pitch is not used as part of the production process.
BAT 178. In order to reduce dust emissions to air from the storage, handling and transportation of coke and pitch, and mechanical processes (such as grinding) and graphitising and machining, BAT is to use a bag filter.  Parameter BAT-AEL (mg/Nm3) (1) Dust 2-5 BaP m0,01 (2) The associated monitoring is in BAT 10.	Dust extraction control units (DECU) are used in the cutting and grinding processes. The DECU are capable of achieving emissions <5 mg/m³. Particulate emissions have been assessed as part of the permit variation and have concluded to be insignificant. The proposed Donaldson dust extraction units are dust cartridge collection systems and are able to achieve the required BAT ELV. Compliant with the BAT requirements
BAT 179. In order to reduce dust and PAH emissions to air from the production of green paste and green shapes, BAT is to use one or a combination of the techniques detailed in the BAT conclusions	N/A . The site does not produce green paste or green shapes as part of the permitted activities.

BAT Requirements	Operator Evidence of Compliance
<b>BAT 180.</b> In order to reduce dust and PAH emissions to air from baking, BAT is to use one or a combination of the techniques detailed in the BAT conclusions	A thermal oxidiser is used to abate emissions from the furnace. This was the subject of the previous permit variation application (December 2019). <b>Compliant with the BAT requirements</b>
<b>BAT 181.</b> In order to reduce dust and PAH emissions to air from impregnation, BAT is to use one or a combination of the techniques detailed in the BAT conclusions	N/A . Impregnation is not carried out as part of the permitted production activities.
<b>BAT 182.</b> In order to reduce SO <sub>2</sub> emissions to air when there is a sulphur addition in the process, BAT is to use a dry and/or wet scrubber.	N/A . There is no sulphur addition in any part of the permitted production activities.
<b>BAT 183.</b> In order to reduce emissions of organic compounds to air, including phenol and the formaldehyde from the impregnation stage where special impregnation agents such as resins and biodegradable solvents are used, BAT is to use one of the techniques detailed in the BAT conclusions Parameter BAT-AEL (mg/Nm3) (1) (2) TVOC m10-40	N/A . Impregnation is not carried out as part of the permitted production activities.
<b>Waste</b>	
<b>BAT 184.</b> In order to reduce the quantities of waste sent for disposal, BAT is to organise operations on site so as to facilitate process residues reuse or, failing that, process residues recycling, including by reuse or recycling of carbon and other residues from the production processes within the process or in other external processes.	Currently, no residues are captured for re-use as they are not suitable for the process and cannot be re-used. All captured dusts are sent off-site for disposal. <b>Compliant with the BAT requirements</b>

5.3 How to Comply with your Environmental Permit - Additional Guidance for Non - Ferrous Metals and the Production of Carbon and Graphite (EPR 2.03)

Table 5.2 Assessment of Indicative BAT

Indicative BAT	Operator Evidence of Compliance
<b>Accident management</b>	
<b>1.</b> You should address the following in your management system: <ul style="list-style-type: none"><li>• storage and use of liquefied gases such as oxygen, chlorine and LPG</li><li>• loss of electrical supplies to control systems and to pollution abatement systems (this may lead to uncontrolled discharges to air and water)</li><li>• flooding, whether caused by rainfall or due to firefighting activities.</li></ul>	<b>1.</b> The site environmental management system covers the storage and use of LNG, however there is no change to the LNG storage as part of this permit variation. <b>2.</b> The CVD control room has a generator for backup / electrical blackout to enable control of the furnace until power is restored. The Environment Agency indicative flood map shows that the site is within Flood Risk Zone 1, with low probability of flooding. For this reason, a flood risk assessment was not deemed necessary. <b>3.</b> The plant layout and storage facilities for reagents and fuels are designed to ensure all materials are contained and in the event of a flood, materials would not be released. <b>4.</b> As part of the site's emergency procedures, the appropriate procedures for responding to, reporting and investigation in the event of a flood will be addressed.
<b>Energy efficiency</b>	
<b>You should where appropriate:</b> <ul style="list-style-type: none"><li><b>1.</b> Produce steam and electricity from the heat raised in waste heat boilers.</li><li><b>2.</b> Use the heat of reaction to smelt or roast concentrates or melt scrap metals in a converter.</li><li><b>3.</b> Use hot process gases to dry feed materials.</li><li><b>4.</b> Pre-heat furnace charge using the energy content of furnace gases or hot gases from another source.</li><li><b>5.</b> Use recuperative burners for the pre-heating of combustion air.</li><li><b>6.</b> Use CO produced as a fuel gas.</li><li><b>7.</b> Consider the use of oxygen as it is recognised to have advantages in many cases and reduces the overall gas volume, allows autogenic operation and can allow smaller abatement plant.</li><li><b>8.</b> Ensure process optimisation to minimise hot metal transfers.</li></ul> Note that energy recovery before or after abatement is applicable in the majority of cases but local circumstances are important, for example, where there is no outlet for the recovered energy.	<b>1.</b> Waste gases are used in the boilers for heating the CVD furnaces. The operator does not reuse any furnace heat at the moment, but it could be considered in the future. <b>2.</b> N/A . No heat required for smelting, roasting or melting as part of the process. <b>3.</b> N/A . No feed materials are dried prior to use in the process. <b>4.</b> N/A - Furnaces are electrically powered, gases are only used as process gases rather than providing combustion fuels. Gases are not recirculated for pre-heating. Waste natural gas is re-used as fuel for the boilers. Options for recirculating will be reviewed in the future. <b>5.</b> N/A . Furnaces are electrically powered and inert atmospheres are used for the process. No combustion air is required. <b>6.</b> N/A . Combustion is not required as part of the process, it is a heat treatment process. <b>7.</b> N/A - Applicable to metals sector <b>8.</b> N/A - Applicable to metals sector

Indicative BAT				Operator Evidence of Compliance
<b>Avoidance, recovery and disposal of wastes</b>				
<div>1. Store materials such as drosses, which may dissolve or react with water, under cover.</div> <div>2. Apply the following options:</div>				<div>1. N/A . no water reactive materials are used at the site.</div> <div>2. The dusts captured in the abatement plant are unsuitable for re-use within the processes onsite as the process requires a cloth rather than dust sized raw material. All captured dusts are sent off-site for disposal.</div>
<b>Sources of residue</b>	<b>Associated material</b>	<b>Residue</b>	<b>Options for dealing with them</b>	
Milling, grinding	Carbon	Carbon and graphite dusts	Use as a raw material in other processes	
Dry abatement systems	Most . using fabric filters or EPs	Filter dust	Return to process, recovery of other metals, disposal	
<b>Point source emissions to water</b>				
<div>1. Achieve as a minimum the benchmark values for point source emissions to water listed in Annex 1 unless alternative values are justified and agreed with the Agency.</div> <div>2. Apply the following options as appropriate:</div>				<div>Only clean surface water (roof/rainwater) is released from the site. There is no treated water released to surface water from the site. Releases to surface water are via a site interceptor. Cooling waters are discharged under a trade effluent agreement.</div> <div>All raw materials and wastes are stored in buildings or undercover (sealed skips) to prevent contamination of surface water. All manufacturing activities are carried out within a building.</div> <div>The surface water system is designed to be separate from the foul water system so as to prevent any risk of contamination.</div>
<b>Sources of wastewater</b>	<b>Associated process</b>	<b>Minimisation methods</b>		<b>Treatment methods</b>
Surface water	All	Design rainwater collection and removal drains to prevent contamination. All raw materials, products and wastes with a potential to contaminate water to be stored under cover.		Settlement, precipitation if needed, filtration.
<b>Point source emissions to air</b>				
<div>1. Demonstrate the reliable operation of control and abatement systems, including as appropriate:<ul style="list-style-type: none"><li>temperature and pressure monitors on filtration plant and associated ductwork</li><li>power consumption indicators on fans associated with extraction systems</li><li>temperature monitoring on exhausts from furnaces and after-burners</li><li>liquor flowrate and pH monitors where wet scrubbing systems are used.</li></ul></div> <div>2. Where VOCs are released, identify the main chemical constituents of the emissions and assess the fate of these chemicals in the environment.</div> <div>3. Achieve the benchmark values for point source emissions to air listed in Annex 1 unless alternative values are justified and agreed with the Agency.</div> <div>4. Apply the following options as appropriate:</div>				<div>1. Spray booths will have pressure sensors on, as for temperature sensors all duct work is rated accordingly. Temperature monitoring is linked to the Delta V process control system which will alert operator of any abnormal temperature fluctuation. An air quality assessment has been undertaken for VOC emissions from the site and this concludes that emissions are not significant.</div> <div>2. The operator will achieve compliance with the limits detailed in the environmental permit for emissions to air.</div> <div>3. Materials are stored and handled appropriately to minimise any potential dust emissions. The site has a management system with procedures which detail handling and storage measures to be applied for materials in use at the site. Dust extraction systems are used for machining rooms (grinding/cutting) with dust emissions collected through use of fabric filters.</div> <div>4. Dust in the materials handling and storage areas is managed through good housekeeping as due to the nature of the raw materials, dust is minimal. Grinding areas dust is captured through the use of dust extraction which captures dust before emission to atmosphere. These systems are maintained according to manufactures recommendations and are part of the EMS procedures. No hydrogen is formed as part of the high-temperature reduction process which is carried out under inert atmosphere.</div>
<b>Process stage</b>	<b>Component in off gas</b>	<b>Treatment methods</b>		
Materials handling and storage	Dust and metals	Correct storage, handling and transfer. Dust collection and fabric filter if necessary		
Grinding, drying	Dust, metals	Process operation. Gas collection and fabric filter		
Thermal refining	Dust and metals	Gas collection and fabric filter		
	Sulphur dioxide	Scrubber if necessary		
High-temperature reduction	Hydrogen	Sealed process, re-use		
<b>Fugitive emissions to air</b>				
<div>You should where appropriate:</div> <div>1. Seal furnaces and reactors.</div> <div>2. Minimise open molten metal transfers.</div> <div>3. Ensure adequate extraction of process exhausts designed for the maximum rate of emission.</div>				<div>1. The Nu-Carb furnaces to be installed at the site are manufactured as sealed units and as part of the design process the furnaces are sealed to minimise any fugitive emissions to air. The furnaces will undergo regular inspections and maintenance following manufacturer guidance to ensure that any risk of fugitive emissions is minimised. This will include regular inspections of seals etc.</div> <div>2. N/A</div> <div>3. All abatement systems have been designed to ensure adequate extraction of process exhausts designed for the maximum rate of emission.</div>
<b>Noise and vibration</b>				
<div>You should pay particular attention to the following:</div> <ul style="list-style-type: none"><li>movement and storage of scrap</li><li>location and sound insulation of large fans and air filtration systems</li><li>rolling mills</li><li>casting installations, especially billet casters</li><li>internal transport</li></ul>				Noise assessments for all plant were carried out in the previous variation in December 2019. Based on the sound ratings of all new plant to be installed, which are 11 dB quieter than the other BAC cooling towers assessed previously (84 compared to 95 dBA LW), and are located further away from sensitive receptors, no further noise assessment has been proposed as part of this variation application. Technical specifications can be found in <b>Appendix H.</b>

Indicative BAT	Operator Evidence of Compliance
<ul style="list-style-type: none"><li>electric arc furnaces.</li></ul>	The site has a noise management plan as part of the site environmental management systems, and this will be updated to include all new plant if required. Further information on noise can be found in section 4.7 above.

**Monitoring**

Where appropriate:

1. Monitor emissions to air to demonstrate you are meeting your permit requirements. See Annex 1 for guidance on achievable levels and BAT.
2. Monitoring of process effluents released to controlled waters should include at least:

Parameter	Monitoring frequency
Flowrate	Continuous and integrated daily flowrate
pH	Continuous
Temperature	Continuous
COD/BOD	Flow-weighted samples or composite samples, weekly analysis, reported as flow-weighted monthly averages.
Turbidity	Continuous
Metals which are likely to be released by the activity	Flow-weighted samples or composite samples, weekly analysis, reported as flow-weighted monthly averages.

3. Monitoring of process effluents released to sewer should include at least:

Parameter	Monitoring frequency
Flowrate	Continuous and integrated daily flowrate
pH	Continuous
Temperature	If the process may generate an effluent >25°C, continuous monitoring is appropriate
COD/BOD	Flow-weighted samples or composite samples, weekly analysis, reported as flow-weighted monthly averages.
Total organic carbon (TOC)	Dependent on process

4. The following table indicates the likely monitoring frequencies for releases to air in this sector:

Substance	Availability of methods for	
	Continuous	Extractive
SO <sub>2</sub>	Y	Y
NO <sub>x</sub>	Y	Y
Particulate	Y	Y
VOC	Y	Y
HCl	Y	Y
HF		Y
Metals		Y
Dioxins and furans		Y
CO	Y	Y

All emissions to air will be monitored in accordance with the requirements of the environmental permit and the monitoring detailed in Table 4.1. There are no process effluents associated with the production activity.

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## 6 CHANGES TO PERMIT CONDITIONS

### 6.1 Changes to existing activities

- 6.1.1 The changes to the existing scheduled activities as a result of this permit variation are detailed in Table 6.1 below:

**Table 6.1 Changes to the existing activities**

Activity Reference	Installation Schedule 1 reference	Description of the installation activity	Activity capacity	Proposed changes
A1	Section 1.2 Part A(1)(f) Activities involving Carbonisation of Carbonaceous minerals	Preparation and Carbonisation of material using Carbon vapour deposition in electrically powered furnaces	Manufacture of up to 48,000 discs per year.	No change apart from increased throughput due to expanded plant as detailed below.
A2	Section 6.2 A (1) (a) Producing Carbon by means of Graphitisation	Preparation and heat treatment of Carbon brake discs	Manufacture of up to 48,000 discs per year.	Installation of four nu-carb furnaces, SECO oven, additional spray booth and dust extraction capacity.
<b>Directly Associated Activities</b>				
A3	Burning of waste as a fuel	Boiler plant operating on waste gas from production process in addition to virgin fuels	N/A	No change
A4	Thermal oxidiser abatement plant	From the outlet of the Carbonisation furnace, including all ancillary ducting to emission points to air	Treatment capacity of 4,500 m3/hr,	No change
A5	Storage and use of Propane in the furnaces	From receipt of Propane to use in the furnaces	N/A	No change
A6	Storage and use of Liquefied Natural Gas (LNG) in the CVD furnaces	From receipt of LNG to use in the furnaces	20 m3 (8 tonnes)	No change
A7	Storage and use of Argon in the furnaces	From receipt of Argon to use in the furnaces	30 tonnes	New DAA added
A8	Storage and use of Nitrogen in the furnaces	From receipt of Nitrogen to use in the furnaces	30 tonnes	New DAA added

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6.1.2 As a result of this permit variation, the following changes will be required to the permit:

- Schedule 1 . Operations: Table S1.1 . update to include new DAAs of storage and use of argon and nitrogen gas in the nu-carb furnaces
- Schedule 3 . Emissions and monitoring: Table S3.1 . update to include the following emissions points (as detailed in Table 4.1 above):
  - . A31 DMG Dust Extractors
  - . A32 DMG Dust Extractors
  - . A33 DMG Dust Extractors
  - . A34 DMG Dust Extractors
  - . A35 DMG Dust Extractors
  - . A36 Spray Booth Extraction
  - . A37 SECO Oven
  - . A38 Nu Carb Furnaces
  - . A39 Nu Carb Furnaces
- Schedule 7 . Site plan . update to include new site plan with revised permit boundary.

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## References

1. How to comply with your environmental permit Additional guidance for: Gasification, Liquefaction and Refining Installations (EPR 1.02) .  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/298028/geho0209bpiw-e-e.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/298028/geho0209bpiw-e-e.pdf)
2. How to comply with your environmental permit - Additional guidance for Non-Ferrous Metals and the Production of Carbon and Graphite (EPR 2.03) .  
[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/298029/geho0209bpir-e-e.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/298029/geho0209bpir-e-e.pdf)
3. Best available techniques (BAT) conclusions for the non-ferrous metals industries - <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016D1032&from=EN>
4. The Environmental Permitting (England and Wales) Regulations 2016 -  
<http://www.legislation.gov.uk/ukxi/2016/1154/contents/made>

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## Glossary

AMP	Accident Management Plan
BAT	Best Available Techniques
CVD	Carbon Vapour Deposition
DAA	Directly Associated Activities
EA	Environment Agency
EMS	Environmental Management System
EPR	Environmental Permitting (England and Wales) Regulations 2016
ERA	Environmental Risk Assessment
IED	Industrial Emissions Directive
LNG	Liquefied Natural Gas
MAL	Meggitt Aerospace Limited
NGR	National Grid Reference
OPAN	Oxidised Polyacrylonitrile
PFD	Process Flow Diagram
SDS	Safety Data Sheets
SCR	Site Condition Report



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## APPENDICES

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# **Appendix A**

## **Application Forms**

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## Appendix B

### Site Plans

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## Appendix C

# Environmental Risk Assessment

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## Appendix D

### Air Quality Assessment

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## Appendix E

### Site Condition Report

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## Appendix F

### Process Flow Diagram

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## Appendix G

### Meggitt Procedures & Work Instructions

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## Appendix H

### Technical Specifications